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THE PROBLEM OF BLADDER-NECK OBSTRUCTION.[1]

By HENRY MORTENSEN, M.S. (Melbourne), F.R.C.S. (Edinburgh), F.R.A.C.S.,
Surgeon to the Urological Clinic, Saint Vincent's Hospital, Melbourne.

DURING the past half-century the region of the bladder neck has been a battleground of medical opinion. Controversy still rages from time to time over the ætiology, pathology, and correct methods of treatment of bladder-neck obstruction. Much confusion of thought has arisen, and it is in an attempt to clarify the position that this paper is being read.

The causes of bladder-neck obstruction may be tabulated as follows:

Prostatic Conditions.

I. Enlargement.
  A. Benign.
    i. Lateral lobe hyperplasia.
    ii. Commissural hyperplasia.
    iii. Trilobar hyperplasia.
    iv. Subcervical hyperplasia.
  B. Neoplastic.
    i. Carcinoma or rarely sarcoma.

II. Inflammations.
  A. Subacute or acute.
    i. Diffuse.
    ii. Abscess.
  B. Chronic.
    i. Diffuse.
    ii. Abscess.
    iii. Median bar formation.
    iv. Chronic cicatricial prostatic urethritis.
    III. Tuberculosis.
    IV. Calculi.

Other Rarer Causes.

i. Bladder tumours.
ii. Bladder diverticulum.
iii. Bladder tuberculosis.
iv. Posterior urethral valves.
v. Hypertrophied verumontanum.
vi. Hypertrophy of the interureteric ridge.

It will be seen that by far the greatest number of cases of this condition arise in relationship to the prostate gland; but from time to time one of the rare conditions mentioned may prove difficult of diagnosis, so that the possibility of extraprostatic pathology must be kept in mind. Occasionally a bladder papilloma may become pedunculated and cause a ball-valve obstruction at the urinary meatus, a carcinoma of the bladder may encroach on this region, or a diverticulum may continue its flask-like development into the pelvis and press on the bladder neck. Posterior urethral valves may occur in a young patient, as also hypertrophy of the verumontanum, whilst the fibrosis and the contracture of bladder tuberculosis may produce obstruction.

Cause of Prostatic Enlargement.

The actual cause of prostatic enlargement is as yet unknown. All the factors held by the older observers to have some ætiological relationship, such as venereal disease, sexual excess, senile degeneration, hypertrophy due to old age and so on, are now definitely disproved. That prostatic enlargement is related to an upset in the endocrine balance of the body is now generally accepted. The prostate is developed as an epithelial evagination of the floor of the posterior portion of the urethra, which results in the formation of a five-lobed gland. The two lateral lobes make up the mass of the gland, the posterior and anterior lobes being simply commissures binding the

[1] Read at a meeting of the Victorian Branch of the British Medical Association on November 5, 1941.

lateral lobes together, whilst the posterior lobe grows but little. These five groups are bound together by a tough capsule formed from the pelvic fascia, "the true capsule of the prostate". The glands forming the prostate are divided into two groups: (i) the submucosal glands lying in closest proximity to the urethra, and (ii) the prostatic glands proper, found further out in the substance of the prostate.

Two other groups of glands that are extraprostatic are also of importance in this region. These are the subcervical glands of Albarran, and the subtrigonal glands described by Home, either of which, by undergoing hyperplasia, may produce symptoms and require treatment.

It is believed by many that all prostatic enlargements arising from the prostate proper develop from the submucosal group of glands. These by their enlargement form a tumour mass which compresses the lateral glands to form a false capsule, out of which the enlargement may be enucleated, and from which conceivably a further development of prostatic tissue may take place after prostatectomy. However, spheroids constituting the earliest developments of prostatic enlargement have been demonstrated in the more lateral portion of the prostate, and it is probable that enlargement may arise from either group.

With the onset of enlargement from any of these sites, the subsequent pathology may be summed up as obstruction infection. The bladder muscle hypertrophies and later becomes dilated, with resultant residual urine. Trabeculation is followed by sacculation and possibly diverticulum formation. Back working further leads to ureteral and pelvic dilatation, and eventual reduction in kidney function. Stasis causes a predisposition to infection in the urinary or genital tract, with the possibility of acute or chronic cystitis or pyelonephritis and of prostatitis, vesiculitis and epididymitis. The combination of stasis and infection leads to calculus formation.

Gross amounts of obstruction may lead to hypertrophy of the interureteric ridge, failure to recognize which may lead to poor results after removal of the causative obstruction.

Diagnosis.

The diagnosis in a suspected case of bladder-neck obstruction may be said to be covered by the following queries: (i) Is lower urinary tract obstruction present? (ii) Is this obstruction at the bladder neck? (iii) To which of the various causes of prostatism is this due; or is some other pathological condition present? (iv) If it is due to prostatic enlargement, what is the amount of obstruction and from what portion of the prostate does it arise? (v) What effects has this obstruction produced on kidney function? (vi) Is there any evidence of urinary sepsis? (vii) What is the general condition of the patient?

An elucidation of these problems is determined by a consideration of the following classification.

Diagnosis.

1. The presence, site and amount of obstruction.
   - a. Clinical symptoms—
     - (i) Obstructive—
       - Hesitation.
       - Diminution of force.
       - Diminution of calibre.
       - Attacks of acute retention.
     - (ii) Irritative—
       - Frequency.
       - Sexual symptoms.
     - (iii) Hæmaturia.
     - (iv) Sphincter upset—
       - Dribbling.
       - Imperious micturition.
   - b. Rectal examination.
   - c. Examination of the prostatic secretion.
   - d. Residual urine.
   - e. Cystoscopy.
   - f. Cystourethrography.
2. The damage obstruction has caused, or with which it is associated.
   - g. General examination—
     - Cardio-vascular upset.
     - Glycosuria.
     - Hernia.
     - Cachexia.
   - h. Urinary examination—
     - Sepsis and bacteriology.
   - i. Function tests—
     - Kidney damage.

The clinical picture of bladder-neck obstruction is a combination of obstruction, infection and sphincter upset. Of these by far the most important are the symptoms produced by obstruction. They are mechanical in origin, and characteristically complaint is made of hesitation in the act of micturition and diminution in the calibre and force of the stream. These symptoms indicate the presence of some abnormal state of affairs at the vesical outlet, coupled with an alteration in the muscle power of the bladder. They also assume importance because whilst they paint a picture very clearly in the mind of the medical man, yet they are regarded in most instances by the layman as the necessary concomitant of increasing age. A similar attitude is adopted towards the necessity to void urine two or three times at night, and the idea that these symptoms demand prompt treatment is often difficult to instil into the mind of the patient.

The development of the condition at the bladder neck, coupled with the infection which so often arises as the result of the stasis produced, leads to irritative symptoms—for example, frequency of micturition, dysuria, and on occasions abnormal sexual symptoms. Hæmaturia may arise from congestion of the veins coursing over a benign enlargement, from the ulceration of a malignant prostate, or from some concomitant pathological condition—for example, bladder or kidney tumour, infection or stone. I do not believe that, because a patient with symptoms of bladder-neck obstruction has hæmaturia, he necessarily has a carcinoma of the prostate, as one so often reads in textbooks. Rather it is the large congestive type of simple prostatic enlargement that produces hæmaturia.

When upset of the sphincter mechanism becomes established, dribbling after micturition and the so-called "imperious" micturition become obvious, owing in each instance to the presence of droplets of urine in the posterior portion of the urethra. The differential diagnosis is not helped to any great degree by the clinical history. One passes then in the investigation of any case to the rectal examination. The positive diagnosis of prostatic enlargement (and by that I mean the diagnosis of the presence of obstruction, the amount of obstructing tissue and the site of obstruction) can be determined by the aid of a finger in the rectum, only in the presence of large lateral-lobe involvement. With other forms of enlargement erroneous opinions may be formed. A malignant tumour of the prostate will provide its findings of hardness, irregularity, fixity and extension outside of the capsule, whilst the firm, small prostate of chronic inflammation, the nodularity of the prostate and vesicles in tuberculosis, the hardness and beading of prostatic calculi, or the tenderness, swelling and heat of a prostatic abscess, may be determined. Should frequency of micturition be a prominent symptom, the examination of the prostatic secretion must always form a part of the investigation, since it serves as an indication of the degree of inflammatory change that is accompanying the enlargement or is causing the symptoms of which complaint is made.

An estimation of the amount of residual urine is the next form of investigation, the passage of a catheter for this purpose being used as one method for ruling out the presence of stricture. This is followed by cystoscopy. I am of the opinion that both of these methods are used too freely, without a proper realization of the risks involved. I believe that the passage of any instrument when a patient is suffering from prostatic enlargement exposes him to the risks of sepsis, acute retention of urine or kidney failure, and should be done only when the indications are definite and preferably when the patient is in hospital. My custom is to submit the patient to cystoscopy if hæmaturia has been a symptom, if there is any doubt as to the diagnosis after the performance of all other tests, or if there is any doubt as to the suitability of a patient for prostatic resection. The procedure is always carried out under spinal anæsthesia; the relaxation thus produced permits the introduction of the instrument with a minimum of trauma. The use of the right-angled lens telescope for this purpose is of little value in the estimation of the amount or site of the obstructing tissue. This demands a telescope of the foroblique type, the line of vision of which is practically directly forward,

permitting an examination of the posterior portion of the urethra as well as of the bladder.

In most cases the information sought by these last procedures may be obtained with very little manipulation by the use of the cystourethrogram. (Reference may be made to an article in THE MEDICAL JOURNAL OF AUSTRALIA of February 7, 1942.) Briefly, the technique of cystourethrography consists in the filling of the bladder by the Janet method using a rubber-bulbed syringe filled with dilute sodium iodide solution (3% or 4%). The picture is taken with the tube centred over the pubes with a downward tilt of 10°. Should diverticulum formation be discovered in this film, a lateral view is taken of the bladder. The patient then voids urine and a further film is taken. He is then placed in a 30° lateral position and the urethra is filled with "Neohydriol Viscus", the picture being taken whilst the fluid is running, as this is the only way in which the posterior portion of the urethra can be outlined. The filled bladder may show the filling defect of prostatic enlargement, the elevation of the bladder above the pubes, or the presence of diverticula. The film taken after micturition demonstrates the amount of residual urine, and if a diverticulum is present, gives important information as to its drainage by micturition. The urethrogram confirms by the amount of elongation of the posterior portion of the urethra the filling defect shown in the cystogram, and will demonstrate a stricture if this is present, as well as the results of chronic prostatic inflammation. I have never seen any ill effects from its use, and I am able from a study of the films obtained to make a preliminary decision as to the correct surgical approach in any case.

The further diagnosis concerns the damage that obstruction has already caused or with which obstruction is associated. This involves a general examination of the patient, an estimation of the amount of infection in the urine and discovery of the organism causing it, and a determination by the use of the various function tests of the degree of kidney damage.

The diagnosis of bladder-neck obstruction due to prostatic enlargement is fraught with pitfalls. The most common of these is the ready acceptance of the presence of an enlarged prostate as the cause of obstruction, where in effect a stricture of the urethra is also present. Treatment of the prostate by open methods and neglect of the stricture will invariably lead to a persistent suprapubic sinus. Secondly, the common association of sepsis with enlargement of the prostate gland is too little realized. Early drainage with the indwelling catheter in these cases may lead to a serious flare-up of infection, with the possibility of epididymitis or a disabling or fatal pyelonephritis. Further, the infective side of the picture may be the important one, and the treatment of chronic prostatitis may be all that is necessary to relieve the patient of his symptoms. Another common cause of difficulty occurs when the patient has what is regarded at the first examination as a large prostate requiring drainage. At the subsequent operation the surgeon may be astounded to find that as a result of the relief of congestion and infection the prostate is now a small fibrous mass, for which open operation is the worst possible procedure and fraught with considerable danger to the patient. Under such conditions it is advisable to leave a small suprapubic tube in the bladder, and to remove the patient's obstruction by resection.

The next warning to be given concerns the danger of accepting the diagnosis of simple prostatic enlargement when frequency of micturition is the outstanding symptom and the symptoms of obstruction are absent or minimal. This is a great temptation when the patient is a man of "prostatic" age, and I have seen patients suffering from genital and renal tuberculosis operated upon with this diagnosis, as also patients suffering from carcinoma of the bladder. Should the irritation causing the frequency of micturition be prostatic in origin, the lesion is probably on an infective basis, for which surgical treatment may do more harm than good.

It is a dogma in urological practice that bladder calculus in a large percentage of cases means lower urinary tract obstruction, and yet one still sees patients with recurrent stone formation and bladder neck obstruction, the only surgical procedure that they have originally undergone being a suprapubic lithotomy; the obstructive element has been completely ignored.

The bladder symptoms of tabes and other nervous diseases are well known, and yet an examination of the nervous system is frequently omitted and the diagnosis is missed.

In obstruction due to prostatic enlargement, the symptomatology and requisite treatment may vary according to the particular site from which the enlargement develops. The simplest and the most common form is enlargement of both lateral lobes. This results in a generally uniform enlargement (although one lobe may enlarge to a greater extent than the other). The posterior portion of the urethra becomes compressed and an actual increase in calibre occurs, particularly in an antero-posterior direction. Then with an increase in tension in the capsule, enlargement may take place in one of two ways: (i) herniation into the bladder through a stretched sphincter may occur, or (ii) the whole process of enlargement may take place beneath the sphincter, giving a true intraurethral development with elongation of the posterior portion of the urethra and elevation of the bladder base.

Diagnosis is made by rectal examination. Despite the gross size of the enlargement, there may be few or no obstructive symptoms, and residual urine may be minimal or absent. Further, some cause of congestion readily leads to an attack of acute retention of urine, and with its relief it is often surprising how completely normal function may return and be maintained over a long period of time.

The second type is that of posterior commissural enlargement. This well-appreciated type is generally known as middle-lobe enlargement, and the tumour may vary in size from a glandular bar to a very large protrusion. The enlargement is always contained within the capsule of the prostate. Interference with muscle action at the bladder neck results in a gross upset in the function of micturition with hypertrophy of the bladder wall and residual urine. Clinically, a typical picture is presented with a combination of severe obstructive and irritative symptoms. Rectally, nothing abnormal is felt. With the onset of acute retention of urine catheterization may be difficult and false passage formation may easily occur. Voluntary micturition is unlikely to be reestablished. Should this type be associated with lateral-lobe enlargement, the well-known "horse collar" or trilobar enlargement is produced. If the onset of enlargement of the lateral lobes follows that of the middle lobe, relief of symptoms may be temporarily produced by elongation of the vesical meatus in an antero-posterior direction.

Thirdly, solitary subcervical enlargement produces an Albarran's lobe and develops from the glands that bear his name. As has been shown, these glands are extracapsular, and when enlarged are covered only by mucous membrane. The tumour may first protrude into the urethra and then push up through the sphincter and rapidly become pedunculated. Randall has pointed out the essential differences between the two types of middle lobe. The posterior commissural type contained within the prostatic capsule assumes a heavy, broad-based, solid, bulky mass of obstruction. Described by Tandler and Zuckerkandl, these lobes are typically Germanic in appearance. The other, belonging to Albarran's school, is French to the last degree; growing free of capsulation and characteristically pedunculated, it appears as a dainty, artistic, symmetrical, poised and graceful lobe.

Diagnosis is difficult, catheterization is easy, though the open indwelling catheter often gives rise to discomfort owing to spasm. At cystoscopy the base of this tumour may be taken as a lateral lobe, and it is only by following the lateral aspect upwards that the summit may be seen and its correct nature determined. When the tumour is small perurethral resection is the method of treatment;

but when it is large it is difficult to remove by this method owing to its instability. Suprapubic removal is exceptionally easy and attended with good results.

All forms of enlargement may be associated. Anterior lobe enlargement is rarely seen, and more rarely still a development from the subcervical glands of Home may be found.

Carcinoma of the prostate is as a rule readily diagnosed, generally by rectal examination or by the presence of osteoplastic bony metastases. There is a type, however, in which, long before the malignant tumour becomes obvious by rectal examination or by the presence of urinary symptoms, extension has taken place and the patient presents himself with an intractable sciatica.

Inflammatory conditions of the prostate are common, the organisms concerned being varied. The stigma of gonorrhœa so universally applied to prostatic infections in many cases is quite unjust. It may be that an attack of gonorrhœa has paved the way for the introduction of other organisms; but in many cases when staphylococci, streptococci or *Bacillus coli communis* are cultivated from the secretion, no such history can be obtained. Acute infections may produce an attack of obstruction of sudden onset; but of greater importance are the chronic inflammatory conditions. The final stage results in the formation of a median bar. An obstruction to the vesical outlet is caused by a thin and abrupt elevation of the posterior vesical lip rising to distort the normal, smooth, urethrovesical outlet. Associated with this there is a much contracted and sclerotic internal sphincter. At the same time the verumontanum is drawn up directly under the bar formation. This condition, which may occur in a patient in a comparatively young age group, is associated with the grossest amount of trabeculation, sacculation and residual urine formation. The presence of unsuspected chronic abscesses in the prostate is often proved by the urethrogram.

There still remains to be discussed a type of borderline case that cannot definitely be placed in any of the groups already dealt with. In many of these the obstructive history is definite; the age is between fifty and sixty years, even earlier, sometimes much earlier. Cystoscopy reveals residual urine, perhaps about three ounces, but there is no definite prostatic enlargement or bar formation. The most positive finding is tightness and fixity of the posterior portion of the urethra, and at cystoscopy the interureteric ridge and the ureteric orifices appear close to the vesical neck. The mucosa of the posterior portion of the urethra and the verumontanum is ragged, and dilated prostatic ducts may be seen. This result of chronic prostatic inflammation is known as cicatricial posterior urethritis, and it may be associated with bar formation or generalized sclerosis of the bladder neck.

Treatment.

A discussion on the treatment requires the answer to three queries: (i) Has non-operative treatment any place in the treatment of obstruction? (ii) When should operative treatment be instituted? (iii) What surgical methods should be used?

The answer to the first question is, of course, in the affirmative. Whilst it is well recognized that the inflammatory type of obstruction is unsatisfactory to treat by any method, it is not realized that in many cases operative procedures may not produce relief but may aggravate the condition. Therefore it is always my rule first to give conservative treatment a thorough trial. This demands prostatic and vesicular massage and dilatation of the posterior portion of the urethra, with bladder and urethral instillations.

Let me say a word concerning prostatic massage. This is a term which poorly describes a procedure which would be better referred to as prostatic expression. Massage is regarded in the minds of many as demanding the exercise of a considerable amount of energy and an amplitude of movement in the massaging fingers. The treatment of prostatic inflammatory conditions, on the other hand, calls for the exertion of a gradual and increasing amount of steady pressure on the prostate and vesicles often aided by compression against the fingers of the opposite hand inserted towards the region through the relaxed abdomen. The exhibition of the sulphonamide group of drugs is indicated; but rarely in these chronic cases do these drugs produce startling results. Conservative measures are further worthy of trial in the mild early case of prostatic enlargement associated with a congestive history. Prostatic massage and attention to hygiene may stave off the pressing symptoms for quite a long time. As Hertzler has amusingly put it: "The incipient prostatic may sometimes be made comfortable for years merely by buying his ducks and fish in the market, by abandoning the frivolous B.V.D.'s and assuming the more dignified garments or even by submitting to the humiliation of wearing spats. Perhaps the substitution of Pilgrim's Progress for the Decameron as bedtime reading should not be forgotten." To this should also be added the importance of the avoidance of alcohol. It is in this type of case that hormonal therapy has been tried most widely.

In 1910, Paul of Liverpool called attention to the histological resemblance between cystic mastitis and prostatic enlargement. He suggested that the two conditions corresponded as a result of some upset in an involution-hyperplasia syndrome and offered the suggestion that the prostate might be under the control of the internal secretory mechanism. The possibility of the relationship between the testis and the prostate had for long been suggested by the results of castration in prostatic enlargement. As far back as 1893 White had pointed out the possibility of cure by this operation. In his report 87% of 111 patients underwent rapid atrophy of their prostatic enlargement.

The psychological upset caused by this procedure and the demonstration of satisfactory relief by various direct surgical approaches to the gland caused this operation to pass into disuse. With a similar relationship in mind bilateral vasectomy had been performed, being first reported by Lennander in 1890. This operation was later publicized by Steinach and further by Neihans in 1927, who introduced the operation now known as "Steinach 11"; in this, instead of the vas being tied, the efferent ducts of the testes are ligated. These procedures had varying results and have fallen into comparative disuse. In 1911, Hoskins suggested that the pituitary gland had some relationship to the alteration in the prostatic glands. He suggested that the pituitary was normally held in check by the gonads. If these were removed the pituitary became over-active and if the pituitary was removed the prostate atrophied. Such an atrophy of the prostate could be prevented by the administration of male hormone.

The facts of the relationship of the hormones of the testes and of the pituitary to the prostate are still obscure. It is probable that the male hormone is secreted by the interstitial cells of the testes, and there are still some who consider that prostatic enlargement is simply due to a diminution of this hormone with advancing age. Others suggest the presence of another hormone which, though not isolated, is referred to as inhibin, its probable origin being the seminiferous tubules. It is regarded under this supposition that the gonadotropic activity of the pituitary is balanced by the output of inhibin from the tubules. A failure of inhibin will result in an over-activity of the pituitary, and the increased output of gonadotropic hormones will stimulate the prostate to become hyperplastic. This has been proved to occur experimentally in a pair of symbiosed animals, one of which was castrated. An obvious hyperplasia of prostatic tissue occurred.

That the explanation of the problem is not quite as simple as this has been pointed out by Zuckerman. He elaborates the idea that the male organism probably secretes, in addition to male hormone, an œstrogenic substance which, in normal circumstances in the earlier age groups, balances accurately the male hormone and possibly acts as a synergist to it. The hyperplasia of the prostate

may in the later age groups result from an over-production of this substance. He points out that the prostate of the male child is enlarged at birth, and that its epithelium shows hyperplasia, owing, it is suggested, to the large amount of œstrogenic substance in the circulation of the mother. On the other hand, it may be that the pituitary in later life, no longer inhibited by œstrin, begins an over-production of gonadotropic hormone which stimulates the genital apparatus.

Out of this confusion and the various pieces of work that have been done to prove or disprove the various theories come the following points of practical interest in the hormonal therapy of prostatic enlargement:

1. Male hormone has been used extensively by many people. In a percentage of cases it has been referred to as "clinically helpful". It has been generally combined with other measures; but the relief has been in the main subjective, and there has been very little indication of a reduction in size of the prostate.

2. If the relationship of male hormone, female hormone and the pituitary is assumed to be a balanced mechanism, and if prostatic enlargement is assumed to be due to lack of male hormone, the injection of large quantities of œstrin should provoke an aggravation of the symptoms. This does not occur. On the other hand, it has been shown that the prostate of a dog can be decreased in size by the administration of female hormone. Investigating recently the effects of castration in man, Huggins found that three months after operation the findings of epithelial atrophy were unequivocal. He believes that in old age the male hormone is decreased in amount, but that some male hormone is necessary for the development of enlargement. If male hormone is completely eliminated by castration, the prostate will atrophy after a period of time. He explored the possibility of "chemical castration" by injection of large quantities of female hormone in an attempt to neutralize the effects of the male hormone, and found that atrophy could be very simply produced. Other observers have recorded their results in the treatment of prostatic enlargement by female hormone, and have noted a decrease in the size of the gland and an amelioration of symptoms.

From what has been said it must be obvious that the whole question of hormonal therapy in prostatic enlargement is still confused, and that there is no accurate basis for the use of either male or female hormone. I have tried testicular hormone in a large series of cases, and have been unable to satisfy myself of any definite improvement in the urinary function in any particular case. As a general tonic its use appears to be justified, as practically all of the patients whilst under this form of treatment felt better. Some lost their senile tremor and had better powers of concentration and memory.

The assessment of the particular time in any case at which operation should be undertaken will demand a careful consideration of many factors—the age of the patient and his general condition, the degree, site and type of obstruction, the presence or absence of infection, and the type of operation necessary for cure. This important decision will vary with the views of each individual surgeon. As a result of specialization, of the better realization of the principles of pre-operative, operative and post-operative management, earlier diagnosis and treatment, and of the use of prostatic resection in selected cases, the mortality and morbidity rate of the treatment of prostatic obstruction has fallen considerably. It is my belief that should operation be advised at still earlier stages, these already good figures will fall still further. In many cases of prolonged obstruction, even after a successful operation the patient still has to contend with bladder atony, infection of urine, the results of back-working and the damage done to his system generally by toxæmia and lack of sleep. This should be avoidable in most cases. I am therefore inclined to the radical view, and I feel that if definite signs of obstruction are found in the form of diminution in the force and calibre of the stream and the presence of residual urine, and if the obstruction is confirmed by other examinations, then the tissue causing that obstruction should be removed. The less pressing the symptoms, the more care must be exercised in diagnosis. Never operate on a patient with an enlarged prostate gland on symptoms alone; the presence of obstructive tissue must be proved.

In discussing the surgical treatment of prostatic enlargement, one considers three clinical types with which the surgeon may be confronted. There is, first, the patient with proved obstruction whose general condition is good, whose kidney function is within normal limits, whose urine is clear on macroscopic examination, and whose residual urine has not reached gross amounts. This patient is fit for an immediate one-stage operation.

Secondly, there is the patient in whose case one or more of the factors mentioned is abnormal. These people require drainage of the bladder before any radical procedures. The types of drainage available are catheterization, either intermittent or continuous, and suprapubic drainage. The use of the catheter carries with it the risk of the introduction of sepsis or the flare-up of an infection already present, and this risk is frowned on by many urologists. That this is so cannot be denied; but one often sees similar upsets after suprapubic drainage, and in cases associated with a large amount of residual urine, sudden decompression (which will occur with any form of suprapubic drainage other than the method of bladder puncture) is dangerous. Suprapubic drainage is undertaken immediately in cases of gross infection of the urine, since the drainage through the tube is probably more effective than through a catheter, or in cases in which kidney function or the general condition preclude any possibility of operation within a reasonable time, say three weeks.

Thirdly, one is confronted with the patient in a state of acute retention of urine. Here, when the presumptive diagnosis of bladder-neck obstruction is made, the greatest care must be exercised in the treatment. It must be fully understood that in many cases of prostatic enlargement the whole prognosis is altered by improper treatment at this stage. The necessity for the strictest asepsis in the passage of instruments along the urethra can never be sufficiently stressed, and I would suggest that one develop the same wholesome fear in handling the lower portion of the urinary tract as one has in dealing with the peritoneal cavity. Roughness and the use of steel instruments produce false passages. The trauma set up leads to added congestion and renders hopeless the passage of any instrument. Sepsis is produced locally in the bladder or prostate, or further afield in the epididymis, or (of more serious import still) in the kidney. A patient who, with proper handling, would after a few days' drainage be either relieved of his urinary retention or in an ideal condition for resection or open operation, is sometimes brought to death's door and the length of his stay in hospital is increased by many weeks. An attempt must be made to relieve his obstruction with a large rubber catheter, preferably of the Tieman's type with a solid tip and a single coudé curve. Should this fail, a gum elastic type of instrument with a bi-coudé or a single long coudé curve will probably negotiate the obstruction. Should these instruments fail, it is unlikely that a metal instrument can be introduced into the bladder along the natural passages. It can be readily pushed through the prostate, since this organ, like the urethra, is comparatively soft. Should the bladder be drained in this way, there will be no relief of congestion and the next attempt at catheterization will be more difficult and produce more trauma. Therefore do not use metal catheters. Should catheterization fail after one or two attempts, then relief of spasm and congestion permitting a successful negotiation may sometimes be attained one hour after the injection of one-quarter of a grain of morphine. The same result may often be produced by the administration of an anæsthetic. When catheterization is accomplished, it is advisable to leave the catheter *in situ*. This may be done even in the private house, providing the urine is drained into a closed sterile system of tubing and bottle. I prefer this to regular catheterization under anything but the most perfect aseptic conditions. It is important to remember that many of these attacks of acute retention of urine occur when

patients have suffered from chronic retention for a long time. The release of back pressure by complete emptying of the bladder may lead to serious complications of hæmorrhage and uræmia. Slow decompression is indicated in any case in which the history suggests this possibility, and no more than ten ounces should be removed at the initial passage of the catheter. Various methods of decompression are available, the simplest of which consists of the release of the catheter hourly and the drainage of five ounces of urine. A similar result is achieved by the pushing of a small hypodermic needle through the side of the blocked catheter, allowing the urine to drip off at this rate. Fluids are then forced, general hygiene is attended to, and antiseptic treatment of the urinary tract is begun.

Operative Procedures.

Operative treatment having been decided upon, a consideration of the necessary surgical procedures for the patient's relief is demanded.

The condition of prostatic obstruction has no doubt been suffered by the same percentage of elderly men since time immemorial, or at least since the time that men have lived sufficiently long to enter the prostatic age. Writers who dealt with the earlier troubles described these symptoms as due to carnosities of the bladder neck, and endeavoured to produce their destruction by the passage of metal instruments. The prostate was described by Ulassa in the middle of the sixteenth century, and since then various tunnelling procedures have been attempted by surgeons whose names are well known in medical history—John Hunter, Billroth, Chopart and others. In 1834 Guthrie produced an instrument carrying a blade at its bladder end for dealing with bar formation. He was followed by Mercier, who in 1836 removed pieces of tissue, and this operation was the forerunner of prostatic resection as we know it now. In 1873 Bottini used the galvanocautery, and in more recent times the prostatic punch and the cutting current loop have been elaborated.

The history of open prostatectomy is of more recent date. The first recorded suprapubic cystostomy was performed for the removal of stone in 1556 by Franco, of Lausanne. The operation fell into disrepute as a method of lithotomy, and it was not until as recently as 1887 that Belfield attempted the relief of prostatic obstruction by removing small portions of the prostate by this approach. In 1891 a perineal approach was described by Goodfellow. This was followed chronologically by the revolutionary work of Fuller, who in 1895 described an operation for the complete removal of the prostate suprapubically. Further results of this operation were published by Guiteras, and in 1902 Freyer published his paper, describing the operation as original, even though in the prolonged and bitter arguments that followed his claim it was pointed out that it had been demonstrated to him by the original writers on the subject. Further milestones in the history of this operation were the recognition in 1899 by Young of the importance of pre-operative drainage; the demonstration by Bentley Squier in 1911 of the value of the high skin and bladder incision, and the importance of intraurethral enucleation; and the work of Thomson Walker and the late Harry Harris.

When we take into consideration the various conditions of the prostate that give rise to bladder-neck obstruction, it must be obvious that there can be no standard method of surgical treatment for the condition. A perusal of the literature readily confirms this opinion, since from the beginning of the century one instrument or one method of prostatectomy has been devised and apparently perfected, at least to the satisfaction of the originator, only to be supplanted by another instrument or method that seems to produce better results. The enthusiastic advocate of one method sees or acknowledges none of its imperfections, nor is he generally willing to speak of the misfortunes or failures that have occurred. There is not, nor can there ever be, a perfect method that in the hands of every urologist will provide the same results. However, this means surely that everyone interested in the subject is entitled to keep an open mind on the subject, and in any particular case the possibility of the patient's being cured by perurethral resection must be given as much consideration as any other form of operative treatment. There is no reason why criticism of the armchair type born of a lack of personal knowledge of the operation, a lack of equipment or a lack of technical skill and experience necessary for its successful performance, should be continually levelled at this procedure. And yet patients are continually raising objections, since they have heard that some other surgeons regard it as a bad operation. Admittedly, it can be a bad operation when the indications are not present or when it is performed by a surgeon with insufficient experience in the posterior portion of the urethra. It has been said that to place a resectoscope in the hands of one who does not possess the requisite urological training is to be compared to handing a Tommy gun to a boy who is fresh from reading the shining adventures of Deadwood Dick. Perurethral resection is an extremely difficult technical procedure. It is tedious and exacting and requires much judgement and patience, and it is only after the experience of a large number of cases that one develops the ability to carry out the resection satisfactorily and with safety to the patient. It is generally agreed that resection is indicated in the presence of median bars or small lateral and middle lobes, and for the removal of the obstructive tissue in cases of obvious carcinoma. The patient obtains relief from his obstruction and his symptoms and insurance against further back-working, with a minimum amount of risk, with an almost complete absence of post-operative pain or discomfort and with a few days' stay in hospital. What of the other types of enlargement? Here the personal experience of the operator, his dexterity and facility to work endoscopically with the patience necessary over a long period of time, will influence his line of action. It may be that in massive enlargement of the prostate, particularly of the lateral lobes, the extra length of time required, the consequently increased loss of blood, the added shock, and the possibility that a second resection may be necessary within a few days, lead one to believe that a prostatectomy may be preferable; but in my experience a large percentage of all cases of bladder-neck obstruction can be dealt with satisfactorily by this method.

The perurethral removal of tissue is achieved either by the use of a guillotine punch which is not equipped with any telescopic arrangement, or by the use of the resectoscope, in which the obstructing tissue is seen through a foroblique telescope and removed by means of the cutting loop. This operation is combined, as in the suprapubic operation, with a preliminary bilateral vasectomy, since epididymitis (the onset of which is prevented by this procedure) is always painful, leads to a long stay in hospital and may easily tip the balance against a very sick patient.

The risks of the procedure are the same as those of prostatectomy—namely, hæmorrhage, sepsis and uræmia, to which may be added the mechanical risks of perforation of the bladder or urethra. Hæmorrhage is controlled at the time of operation by light coagulation through the instrument. The incidence of sepsis of a serious nature has not led to any serious worry since the introduction of the sulphonamide compounds. It appears that the possibility that kidney failure may follow a resection is less than after prostatectomy. Thompson, at the Mayo Clinic, has had year by year a gradually decreasing percentage of cases in which any preliminary drainage has been done. He states that the best method of drainage of the bladder is by the normal act of micturition, which is obtained after resection. Be that as it may, I am of the opinion that no prostatic patient should be operated upon until he is as well in every respect as he can be made. Patients whose general condition permits little improvement appear to stand the operation of resection very well. The operation is not simply an attempt to form a gutter along which the patient may pass his urine, but all the obstructing tissue should be removed and as much of the residual prostatic tissue as possible. In an attempt to achieve this end the muscle of the sphincter of the bladder neck is seen and over a wide area the capsule of the

prostate is in most cases demonstrated. After operation the bladder is drained by catheter for three or four days, and should the act of micturition be normal the patient is allowed up. Much criticism has been levelled at this operation, on the ground that many patients still have an amount of two or three ounces of residual urine in the bladder after what has appeared to be an adequate resection. I admit this; but providing the patient is able to void a good stream with ease, I am certain that if his condition is checked in three months the bladder atony responsible for the retention of this amount of urine will have disappeared and the bladder will now be empty.

In those cases in which on account of the size of the enlargement a suprapubic operation is indicated, the various principles to be followed are as follows:

1. The incision into the bladder should be placed as high as possible. One of the common sources of suprapubic fistula after prostatectomy is adherence of the sinus to the pubic bone. In the preliminary cystotomy in a two-stage operation the same principles should be followed.

2. In the opening of the bladder, care must be exercised to avoid opening up too widely the prevesical space, since the dead space caused is a potent source of post-operative sepsis.

3. The enucleation of the prostate must be performed by the intraurethral method, and must be achieved within the prostatic capsule, any deviation from this plane resulting in hæmorrhage, sepsis and scar tissue formation. In the trilobar type of enlargement an attempt must be made to remove the gland in one piece. Failure to remove the posterior commissural portion (which is quite easy to do) may leave the patient with a major portion of his obstructive tissue still *in situ*.

4. Hæmostasis must be as perfect as can be obtained. This is best achieved by direct suture under vision. Many prostatic patients are lost, I feel sure, because of loss of blood at the time of operation and subsequently. They do not necessarily die from hæmorrhage; but their cardio-vascular system is so far upset by the loss of blood that death ensues within a few days from this cause or they fall an easy prey to infection.

Conclusion.

The further details of the surgical procedure vary with individual opinion, and their discussion is more suited to a meeting of surgeons only. In this talk I have not had time to discuss the finer details of treatment nor to give you statistics and results. Mayo once said: "Statistics can prove anything, even the truth." So they may well be omitted. However, I have endeavoured to restimulate your interest in the bladder neck and to demonstrate what a fertile source of problems this region may be. Every case of bladder-neck obstruction is one of considerable interest; not just another "prostate" that disturbs the general practitioner from his well-earned rest. The patient is an individual (old though he be) who requires study from both a medical and a surgical point of view, and whose troublesome symptoms can be relieved with a possible percentage mortality much below that of a few years ago. Not so very long ago Keyes wrote as follows:

> I am in the habit of looking on a patient with this condition as I would regard an individual in an open field bordered by a deep and rapid river. The individual cannot swim but an enraged bull is chasing him and he must either suffer himself to be impaled or gored to death (this is his prostatic disease) or he must cast himself into the flood and trust to some kindly Providence to fish him out (this is prostatectomy).

We have, I venture to suggest, progressed far from those days. I believe that we can progress still further by an understanding by the medical profession of the diagnostic problems involved, and of the necessity for early operation, and by the education of the layman to a realization that relief of his symptoms can be attained with a degree of simplicity and safety unknown a few years ago.

APPLICATION OF HIRST'S PHENOMENON TO THE TITRATION OF VACCINIA VIRUS AND VACCINIA IMMUNE SERUM.

By F. P. O. NAGLER, M.D. (*Frankfurt am Main*),
From the Walter and Eliza Hall Institute of Research in Pathology and Medicine, Melbourne.

IN July, 1941, a paper by G. Hirst[1] appeared in *Science* describing the phenomenon of agglutination of red cells by allantoic fluid of chick embryos infected with influenza virus.

This observation was readily confirmed at the Walter and Eliza Hall Institute, and methods based on the phenomenon have been developed particularly for the titration of antibody against influenza viruses. The other viruses which were available in the laboratory were also tested for their ability to produce agglutination of this type, and it was found that vaccinia virus has a similar effect on the red blood cells of the fowl.

As in the case of influenza virus, the agglutination is specifically inhibited by corresponding immune serum, and a method of estimating antivaccinial antibody in human or animal serum has been developed on this basis.

Materials Used for the Agglutination.

The vaccinia virus used in the preparation of the virus suspensions was obtained from the Commonwealth Serum Laboratories, Melbourne, in the form of glycerolated calf lymph. It has been maintained by passage on the chorio-allantoic membranes of chick embryos.

Allantoic fluid is not a suitable source of high titre vaccinia virus, and other methods had to be used to obtain virus of high enough titre to allow practicable titrations. The method finally adopted was as follows:

Stock virus, usually diluted 1 in 100 in broth, was inoculated on the chorio-allantoic membrane of ten-day chick embryos. The method of inoculation was that of Burnet.[2] After three days' further incubation the chorio-allantoic membranes, which showed a confluent mass of specific foci with secondary œdema and cellular infiltration, were cut out and kept under sterile conditions in the ice chest for a further two days. The suspension of the virus was then prepared by grinding these membranes with quartz powder in a mortar. The material was taken up from the mortar with 0·5 cubic centimetre of normal saline solution containing 0·44% calcium chloride for each membrane, and was then spun down at a speed of 2,500 revolutions per minute. The supernatant fluid was taken off and used as the virus suspension in the agglutination test.

Rabbit immune serum against vaccinia virus has been obtained by one or more intracutaneous injections of saline suspensions of virus. The animals were bled about twenty days after vaccination. The serum was taken from the clot and inactivated at 56° C. for twenty minutes. Other rabbit immune serum has been prepared by intratesticular injection of virus.

Human serum has been obtained from subjects vaccinated either with calf lymph or with virus prepared from egg membranes. The subjects were bled before and at different times after vaccination.

Red blood corpuscles were obtained from blood taken from the wing vein of a fowl into citrate saline solution. The cells were washed twice and made up to a 2% suspension in physiological saline or calcium saline solution. It has been found that cells from some fowls (particularly from older birds) were much less susceptible than normal. Each batch of cells should therefore be checked with a virus preparation known to be active.

Method of Titration.

The virus suspension was distributed in falling dilutions of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$ . . . and in a quantity of 0·25 cubic centimetre in each tube. The tubes used had an inner diameter of approximately 1·2 centimetres.

An equal amount of 2% suspension of chick or hen cells was added and the fluid in each tube was made up to 0·75 cubic centimetre with saline solution. After having been

shaken the mixture was allowed to stand in the incubator for 1 hour at 37° C. and then the result was read. The results were marked "+++", "++", "+", "±", "0"; "+++" represents maximal agglutination, in which the cells are distributed in compact clumps that adhere to the glass over most of the bottom of the tube; "++" means a nearly complete agglutination, somewhat finer in surface appearance and more concentrated at the bottom of the tube; "+" indicates an incomplete agglutination with an unagglutinated centre; "±" indicates only a trace of very fine agglutination at the edge of the unagglutinated deposit. In tubes in which no agglutination occurs ("0") the cells settle to a small uniform deposit with a smooth circular edge at the bottom of the tube.

The vaccinia-antiserum titration was set up in almost the same way as the straight vaccinia titration. Doubling dilutions of a suitably active virus preparation were made in amounts of 0·25 cubic centimetre. A uniform concentration of serum chosen according to a rough preliminary test was added to each tube in the same volume (0·25 cubic centimetre). The virus-antiserum mixture was allowed to stand for half an hour in the incubator at 37° C. before the final addition of the red cell suspension. The results were read after incubation for a further hour.

Results.

Vaccinia suspensions prepared as described from chorio-allantoic membranes showed agglutination with hen cells to a dilution of 1:256—that is, to a final dilution of 1:768. Vaccinia virus grown in allantoic fluid or amniotic fluid gave only very feeble agglutination with hen or chick cells, at a dilution of 1:4. Red blood cells of other birds and mammals have been tested: human, sheep, horse, rabbit, duck, sparrow, finch and canary. Only the duck and sparrow cells showed a slight agglutination with the vaccinia suspension obtained from chorio-allantoic membranes.

Rabbits which had been vaccinated either intracutaneously or intratesticularly gave serum which specifically neutralized the agglutination. Limited experiments showed that demonstrable antibody was present ten days after a single intracutaneous injection, that a high level was present at twenty days, and that only a slight fall in titre was shown by serum taken eight weeks later. One of these samples of rabbit serum, V 2, has been taken as a provisional standard, and all titres of other samples have been expressed in terms of its activity, which is taken as 1·0 unit.

As an example of the application of the method to human studies, Table I shows the results of titration of consecutive samples from one subject taken before and at various intervals after vaccination. Glycerolated material from eggs inoculated chorio-allantoically with original calf lymph has been used for vaccination of this subject.

The calculations used to provide the values given in the final column of Table I are valid only on the assumption that the neutralization obeys the law of constant proportions—that is, if undiluted serum just neutralizes virus diluted 1:2, serum diluted 1:5 will neutralize virus diluted 1:10, and so on. This has been established within the limits of experimental error in experiments with serum V 2 in dilutions ranging from 1:2 to 1:400 against suitable doubling dilutions of virus.

In the case quoted in Table I, it will be observed that this particular serum (22) showed an increase of titre from 0·0025 units before vaccination to 0·4 units twenty-one days after vaccination.

Discussion.

These experiments with vaccinia virus will help to indicate the great importance and potential fertility of Hirst's discovery. Apart from a few tests made by the mouse intracerebral method, there has hitherto been no satisfactory means of estimating the immunological response to vaccination other than revaccination at various times afterwards. The present work has advanced far enough for us to be certain that the fowl cell agglutination method supplies an accurate and convenient method of measuring the antibody response to vaccinial infection.

Should circumstances allow, it is hoped to use the method to provide evidence as to what is the most convenient and effective method of vaccination. Despite the general tendency nowadays to use a small single insertion, the old evidence that protection was related to the number and area of visible scars has not been refuted. A comparative series of antibody curves following the different types of vaccination would probably convey much more information than any other practicable investigation.

Another point of importance concerns the replacing of the classical method of calf lymph production by the much quicker and less objectionable method of culture in the developing egg. In this Institute some scores of persons of all ages have been vaccinated with egg lymph, with apparently satisfactory results. A comparison of the immunological responses to egg and calf lymph vaccination is at present in progress.

A final possibility is the use of the agglutination test to provide a rapid determination of the potency of material prepared for vaccination. This will depend, of course, on whether agglutinin activity and infectivity will prove to be sufficiently closely correlated to allow the use of such a test.

The physical basis of this agglutination of red cells by preparations containing vaccinia virus (or influenza virus) is still unknown. It is of quite different character from that produced by acquired or natural hæmagglutinins of the ordinary immunological type. The scanty evidence available suggests that the virus particles themselves

TABLE I.

In Vitro Titration of Vaccinia Virus and Vaccinia Immune Sera.

Materials.	Dilution of Serum.	Dilution of Vaccinia Virus Suspension.									Serum Control.	Titre of Human Serum in Terms of Standard Serum V_2.
		1/2	1/4	1/8	1/16	1/32	1/64	1/128	1/256	1/512		
Vaccinia virus XV and saline solution		+++	+++	+++	+++	+++	+++	++	±	0		
Vaccinia virus XV and standard immune serum V_2	1/50	+++	+++	++	±	0	0	0	0	0	0	1·0
Vaccinia virus XV and human serum 22 taken before vaccination	1/10	+++	+++	+++	+++	+++	+++	++	±	0	0	
Vaccinia virus XV and human serum 22 taken before vaccination	1/1	+++	+++	+++	+++	+++	++	±	0	0	0	0·0025
Vaccinia virus XV and human serum 22, taken twelve days after vaccination	1/10	+++	+++	+++	+++	++	±	0	0	0	0	0·05
Vaccinia virus XV and human serum 22, taken twenty-one days after vaccination	1/10	+++	++	±	0	0	0	0	0	0	0	0·4
Vaccinia virus XV and human serum 22, taken twenty-eight days after vaccination	1/10	+++	++	±	0	0	0	0	0	0	0	0·4

rather than some soluble product are responsible for the agglutination; but this view may well be changed by further work. Ignorance as to the physical basis of Hirst's phenomenon, however, in no way diminishes the practical importance of its applications to the problems of vaccination and influenza.

Summary.

1. Suitable preparations of vaccinia virus cause specific agglutination of fowl red cells of similar type to that observed by Hirst with influenza virus.
2. This agglutination is inhibited by human or animal immune serum.
3. A method has been developed for the quantitative estimation of antibody produced as a result of vaccination.
4. Possible applications of this method are discussed.

Acknowledgement.

I am much indebted to Miss F. E. Williams for her help in the vaccination and bleeding of the subjects of the experiment and to the subjects themselves for their willing cooperation.

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(1) G. K. Hirst: "The Agglutination of Red Cells by Allantoic Fluid of Chick Embryos Infected with Influenza Virus", *Science*, Volume XCIV, July 4, 1941, Number 2427, page 22.
(2) F. M. Burnet: "The Use of the Developing Egg in Virus Research", Medical Research Council of the Privy Council, Special Report Series, Number 220, 1936.

A NOTE ON THE PRESERVATION OF CERTAIN BACTERIAL CULTURES UNDER PARAFFIN OIL.

By R. T. SIMMONS.
From the Commonwealth Serum Laboratories, Melbourne.

DURING the present emergency many laboratories may desire to store cultures safely for long periods. This note is submitted in the hope that the observations recorded may be of use to others.

Morton and Pulaski (1938) have tried several methods of keeping bacterial cultures and recommend one which has now been used for three years in these laboratories and found very satisfactory. The method was not new (references are given by Morton and Pulaski), but it does not appear to be widely known. By its means hundreds of strains of the hardier organisms have been kept here, at room temperature, so that they were continually accessible without the need of regular subculture except at long intervals.

Experience with many strains of a few of the hardier bacteria has confirmed the experience of Morton and Pulaski, which was gained with only one or two strains of each species. No culture was lost and very few were contaminated.

Overnight slope cultures were completely covered with sterile liquid paraffin (heavy mineral oil; Parke, Davis and Company) and stored in a dark cupboard at room temperature. The slopes should be moist, and they should be inoculated to the bottom of the slope so that some bacteria are suspended in the water of condensation which remains at the bottom of the slope under the paraffin. The paraffin was sterilized by dry heat at 160° C. in amounts of 15 millilitres heated for one hour, or in amounts of two litres heated for two hours. Autoclaving or the presence of moisture in the container caused turbidity. Paraffin from discarded cultures may be strained through gauze, sterilized and used again.

The top of the culture slope must be covered by the paraffin (preferably half an inch above) in order to prevent drying. A long, stiff, platinum loop was used to remove the growth from the bottom of the slope, where the organisms remained viable longer than at the top. After one year it was occasionally necessary to replace the paraffin with broth in order to obtain growth, but it was generally sufficient merely to transfer a loopful of organisms to broth.

The bacteria stored are shown in Table I. In this the times of survival were not the maximum; some cultures of group A streptococci were viable after 30 months.

The group G streptococci shown in Table I were of the large colony type; strains of the minute colony type survived for three to six months only. Mr. P. L. Bazeley has found that streptococci of animal origin of groups B and C survived at least twelve months, but that streptococci isolated from strangles (*Streptococcus equi*) survived only for one to three months. Mr. J. R. Garnet has found that 40 old or freshly isolated strains of *Neisseria meningitidis* cultivated in liver agar stabs for seven days at 37° C. and covered with liquid paraffin survived for twelve months at 37° C.

Bibliography.

H. E. Morton and E. J. Pulaski: "The Preservation of Bacterial Cultures", *The Journal of Bacteriology*, Volume XXXV, 1938, page 163.

TABLE I.
Survival of Cultures on Solid Media under Paraffin Oil at Room Temperature.

Organism.	Number of Cultures Stored.	Culture Medium.	Interval Before Subculture. (Months.)
β streptococci of human origin: group A	500	Moist blood-agar slopes.	12
β streptococci of human origin: group B	100	Moist blood-agar slopes.	15 to 19
β streptococci of human origin: group C	113	Moist blood-agar slopes.	15 to 19
β streptococci of human origin: group G	80	Moist blood-agar slopes.	15 to 19
Corynebacterium diphtheriæ	32	Moist serum-agar slopes.	19
Salmonella bacilli	100	Moist nutrient agar slopes.	24
Staphylococci	396	Moist nutrient agar slopes.	12 to 24

THE PSYCHIATRIC EXAMINATION OF RECRUITS.

By N. V. YOUNGMAN,
Brisbane.

ONE of the most distressing features of our present political system is the difficulty of applying proved scientific advances to the benefit of our community. This neglect to provide for the welfare of the people is most clearly and frequently illustrated in medical practice. It would seem most illogical to suggest that economic gain would result from the introduction of measures such as improved housing, immunization and the like. One can attribute this lack of understanding by the business and political world only to its domination by profit and the associated "machine-mindedness". If employers were rational in this profit policy, they would greedily absorb and apply to their factories such lessons as Dr. H. M. L. Murray gave recently in showing that the "souls of the machines" affect the output as much as does their mechanical efficiency. Rather does the constant humming and drumming of the machines hour after hour, day in and day out, signal that the maximum effort is being attained. And although in this machine age we, as medical men, feel justified in pointing out from time to time these seemingly obvious truths, yet a detached analysis of our own attitude to disease is not at all incomparable. We have surely stressed the physical

factors in disease and health, while the "souls of the bodies" occasionally warrant some attention. We too little heed the facts of independent investigators that 30% of ill health has a psychological set-up.

This attitude is only too well exemplified in our present methods of examining men for the Australian Imperial Force. As is right, every endeavour is made by clinical methods and ancillary measures to see that each candidate fills certain physical standards of a very high grade. Yet the question of his having adequate mental ability to cope with the war machine depends on the attitude and, perhaps, enthusiasm of the examining board, rather than on any fixed criteria, as befits the physical examination.

I propose to discuss the problem by considering in turn the ideal system, the present system, and the examination of certain data on which to formulate a practical plan to suit local conditions.

The Ideal System.

In the ideal system of recruiting an evaluation of both the physical and the mental make-up of each recruit would be made. On the physical side would be noted not only defects, but also positive assets, such as good sight, keen sense of smell, fleetness of foot, strength of limb and the like. At the same time the question of the degree of improvement or elimination of the defects should be recorded. The need for treating any such defects would depend on the number of recruits available, the potential worth of the recruit in question *et cetera*. So, too, on the mental side would be noted both the positive and the negative side of the various mental attributes, such as intelligence, leadership, mood *et cetera*.

The man is assessed as an individual rather than as someone satisfying certain physical standards like height and weight. The sum total of assets and liabilities is weighed before he is placed in the military machine. This procedure would serve (i) to exclude the obviously unfit men, (ii) to place men only in a position in keeping with their capabilities, (iii) to estimate disabilities, especially physical, in relation to the usefulness and mental calibre of the man, and (iv) to exclude apparently sound men who will break down under service conditions. Let us examine these groups in greater detail.

To Exclude the Obviously Unfit Men.

The various hardships and other contingencies likely to arise on active service demand a certain basic standard of physical fitness. This standard appears to have slowly evolved by the exclusion, one by one, of those defects which prevent a man from functioning efficiently on the war front, rather than by a consideration of them in conjunction with any positive attributes. Yet in the mental sphere the standard has been laid down only to exclude the "mentally unfit". Just as the various body systems have been considered in turn, so too should the various factors of one's mental make-up. Admittedly this is not easy; but certain traits, such as intelligence, are capable of a closer definition. The obviously unfit would then be those men not possessing the basic mental and physical requirements.

To Place Men only in a Position in Keeping with Their Capabilities.

To place men only in positions in keeping with their capacity presupposes a second series of standards. The extremely varied types of army positions, from orderly to general, should all require their own standard. At enlistment a man would be immediately drafted to his correct unit according to his gifts (leadership, technical ability *et cetera*). At the same time, such a man should not receive promotion unless he had the requirements needed for this extra responsibility. One too often sees men returning home with a "neurosis" that is attributed to war service; but although it occurs on service, it is really "constitutional" and arises from the burden of powers and responsibility out of proportion to the men's capabilities.

To Estimate Disabilities, Especially Physical, in Relation to the Usefulness and Mental Calibre of the Man.

The reason for the estimation of a man's disabilities will be apparent from the present recruiting figures: 20% of men are rejected for physical disabilities. There should be a number in this group capable of good service, an extreme example being the exceptional exploits of a legless pilot. However, only a careful evaluation of the rejected men would allow one to speak with authority on the possible utilization of such men. A man with nervous disorder is said to be worth training, if his war record is satisfactory before his breakdown occurs. Surely this same argument could be applied to physical disorders; and whether the aftermath of chronic physical illness is more crippling than comparable nervous states is very doubtful.

To Exclude Apparently Sound Men who Will Break Down under Service Conditions.

To exclude apparently sound men who will break down under service conditions is a difficult problem. It can be viewed from the medical, military and economic aspects. From the military aspect certain men will break down; but if in the interim their military service has been of value, then the expense of their training and post-war pensioning is warranted. At the same time, there is a considerable loss in time and money in training men who will be of no military value. Their mental make-up makes them difficult to train, and they are a retarding influence on the training of other men. They are a danger in emergencies. Their breakdown often occurs before or soon after they go into action. The economic aspect is shown by such figures as the following: psychiatric disabilities of the last war cost the United States of America $1,000,000,000, and we in Australia pay £5,000,000 *per annum*. It is difficult to believe that this huge expenditure for psychological disabilities can be attributed entirely to war service. Poor psychological material is still accepted because of the common view that army discipline will improve these men. The medical aspect is more idealistic. It would prohibit the utilization of any man liable to permanent disability from the action of war stress. The solution must be a compromise between these conflicting views.

The Present System of Recruiting.

Let us now consider the present method of recruiting. On the physical side a recruit has to satisfy certain standards before being accepted. No record is kept of any particular assets nor of the significance of the defects, the examination being purely aimed at the exclusion of applicants with certain well defined disabilities. On the mental side the examiners are asked to exclude the "mentally unfit". They arrive at this conclusion by their observations of the men during the interview, together with the man's reply to three questions: "Have you ever suffered from neurasthenia or nervous trouble?" "Have you had fits of any kind?" "Has any member of your family suffered from nervous ill health or mental trouble?"

When one considers the present constitution of examining boards drawn from general practitioners and specialists in all branches, hurried for time and seldom interested in this aspect of the problem, it can hardly be expected that great attention is given to the mental aspect of the examination. One would be agreeably surprised if the terms "neurasthenia" or "mental breakdown" had the same meaning for the recruits one hoped to cull out as they have for the examining board.

These few theoretical considerations are borne out by an examination of recruiting figures. Table I shows the result of the examination of 3,318 recruits, of whom 683 were rejected. It will be noted that of all disabilities those concerned with the nervous and mental states form the smallest group. This number includes men with severe head injury, nervous disorder *et cetera*. One has great difficulty in believing that the intellectual and mental health of our community is of such a high standard. These figures show too clearly our domination by the physical aspect of health.

TABLE I.

Results of Examination of 3,318 Men.

Disability.	Number of Men Rejected.	Percentage of Total Recruits Rejected.	Percentage of Rejected Men.
Orthopædic	149	4·5	21·6
Circulatory (including varicose veins)	135	4·1	19·7
Ear, nose and throat ..	64	1·9	9·1
Other abnormalities (including glycosuria) ..	64	1·9	9·1
Genito-urinary	56	1·7	8·2
Skin	50	1·5	7·3
Eye	40	1·2	5·8
Hernia	34	1·0	5·0
Pulmonary	34	1·0	5·0
Poor physique	22	0·7	3·2
Mouth	19	0·6	2·8
Nervous and psychiatric	16	0·5	2·3
Totals	683	20·6	99·4

The Results of Certain Surveys.

It would seem, on theoretical grounds, that some alteration in the present system of examining recruits is necessary. Before any such procedure was considered, it was thought desirable to make certain surveys to see whether practical reason substantiated the above considerations. For this purpose a number of recruits were psychologically tested and some psychiatrically examined. Further, a number of records of men from the last war with nervous disorders were examined to gain information as to the actual worth of training such men.

The Results of Psychiatric Examination.

Owing to the limited psychiatric assistance available, some method of sifting out the psychopathic material was necessary to avoid loss of skilled time on relatively normal recruits. The obvious solution seemed to lie in a *questionnaire*, so planned as to allow a suitably trained lay person to apply it. It must be now emphasized that this person does not assess the recruit's mental state from the replies he receives. This would be possible only if a trained psychiatrist were doing the questioning. The original *questionnaire* used has been modified till the adoption of its present form. It will be seen that the questions used are intended to discover the presence or previous occurrence of those symptoms most frequent in the less spectacular but more common forms of nervous disorder. It is for this reason that question 19 has been the most valuable. Such *questionnaires* cannot only be harshly criticized on scientific grounds, but also in this instance there may be a tendency for the men to evade or distort their answers to these questions. However, my observations lead me to believe that this happens only in isolated cases.

This *questionnaire* was first applied to unselected recruits. These were men who had just been passed by their medical boards and were awaiting drafting to their various units. It was found by this means that approximately 10% of the recruits required further psychological investigation. At the same time 3% to 5% of these men have upsets of a severe degree.

One may instance as a gross example a man who reached fifth class at school, although he was generally at the bottom. After this he "knocked about". If he gets up quickly "everything goes blank". To the question "Do you suffer from headaches?" he replied "My oath". He also has indigestion and occasional periods of restlessness and excitability. He has two nervy sisters, and joined up because "all his cobbers had gone". Even on this meagre evidence one would indeed be optimistic if one thought that the training of such a man would be of value.

This percentage was based on the examination of only 100 recruits; but they were examined in groups, and it was apparent that the figure was fairly constant for each group. This figure merely stresses the fact that 10% of recruits passed for the Australian Imperial Force should receive further attention, and not that they should be rejected. At the same time probably 3% to 5% of these men would make inefficient soldiers.

Questionnaire.

1. Where did you go to school?
2. What grade did you get to at school?
3. What position in the class?
4. At what age did you leave school?
5. Were you worried by examinations?
6. What work have you done since leaving school?
7. How many positions have you had?
8. Why did you change them?
9. Do you worry very much?
10. What sort of things worry you?
11. Do you mix easily with others?
12. Do you like meeting people?
13. Are you troubled by shyness?
14. Have you many friends?
15. What do you do in your spare time?
16. Have you any hobbies?
17. Do you play any games?
18. Do you read?
19. Do you ever get any of these symptoms: eye trouble, palpitation, shortness of breath, indigestion, stomach ache, headache, dizziness, rheumatism, backache, shakiness, weak and tired feelings?
20. What is your memory like?
21. Do you at any time get feelings of being irritable, moody, depressed or low-spirited?
22. Do you ever get any periods of being excitable, restless, wanting to be on the move?
23. How do you sleep?
24. Do you ever get feelings of loneliness?
25. Have you had any turns or fainting attacks?
26. Have you had any trouble with your nerves?
27. What other sicknesses have you had and how long did they last?
28. Have you ever been nervy?
29. Do you think you are highly strung?
30. Is anyone in your family nervy or had any trouble with their nerves?
31. Did you ever stutter or stammer?
32. Do you sit about thinking a lot?
33. Have you any superstitions and fears?
34. Why did you join up?
35. Do you like army life?
36. Are you interested in racing?

The Results of Psychological Tests.

The psychological test is similar to the "Army Alpha", the American army tests. It is given in ten parts, which measure native ability as well as educational experience and training. Professor Kyle and his assistants have group-tested 911 recruits. This examination was instituted to select men capable of being trained as officers. Up till the time of this inquiry little attention was given to the men with low scores. If one is going to have the most capable officers, it is also a necessary corollary that the material under their command can absorb their instruction. The results of testing 911 men are given in Table II. The maximum scoring in this test is 225. The equivalent of certain scorings to the intelligence quotient is given in order to make the results comparable to those obtained elsewhere. At the same time it must be emphasized that this is only approximate.

TABLE II.

Score.	Rating.	Percentage of Troops.	Approximate Intelligence Quotient. (Terman.)
Above 191	Very superior.	1½	
From 159 to 191 ..	Superior.	8½	
From 127 to 159 ..	High average.	23½	106–115
From 95 to 127 ..	Average.	33½	96–105
From 63 to 95 ..	Low average.	23½	86–95
From 31½ to 63 ..	Inferior.	8½	
Below 31½	Very inferior.	1½	

In the main this test has proved very satisfactory. Men chosen from the superior groups for officer training schools have completed their courses with credit. Occasionally poor scoring is due to language difficulties, inaccessibility to educational facilities and incooperability. These figures show that it would be essential to reexamine the 9·75% of men comprising the "inferior" group. If one had the assistance it would also be desirable further to examine those in the "low average" group.

The results of applying the *questionnaire* to those men with low scoring in this test—that is, to those men "inferior" and "very inferior" in type—are now given. Theoretical consideration of this test would obviously suggest that this group would be of doubtful worth, and this is readily borne out by the results obtained in the *questionnaire*. The advantage of the latter test is that, as it is given individually, one can discover reasons, such as language difficulties and anxiety, for which the men do not perform satisfactorily in the group test.

These men fall into the following groups: the obviously mentally subnormal, the men with poor records, the men with a set-up for a neurosis already present, men with excessive anxiety, and lastly men with psychopathic tendencies, especially of the schizoid group. Several examples will be given.

One man reached the second grade and admitted that he was usually high up. He then "farmed in" a number of positions. His replies to most questions were vague; for instance, to "Have you had any trouble with your nerves?" he replied: "Some time they jump in bed." He also stuttered. He was unable to remember his regimental number without referring to the disk each time, and he had a mongoloid facies.

It is hard to see how such a man could attain any degree of efficiency.

The man with the "neurotic" set-up reached third class, although his position was usually low. He then did "all sorts of work". He suffers from indigestion—"a good bit, sort of heartburn, especially with worry"; from headache—"rippers, often and occur over the eyes"; from dizziness—"especially if I stoop"; from "creaky back at times", especially if he moves about or stoops. He joined up because "his mates went", but he wants to go back to the country.

Should such a man reach the bombing area, no doubt he would soon return, perhaps with a post-concussive syndrome; yet his symptoms would already be present before he went away.

A man of psychopathic type was very antagonistic and hostile to the tests. His school record was satisfactory, and until his weight became excessive he followed the turf. He has periods of irritability and restlessness and suffers from palpitation. Three of his sisters are "nervy". The novelty of any new situation readily wears off.

One can imagine his antisocial trends being of considerable nuisance value in army camps.

A half-caste man reached sixth grade at school and then did station work. He would usually stay in one place for three months and then want to move on. He has periods of two or three days of irritability, when he will not talk. He is a nail-biter and shakes when doing things of which he is uncertain. Each day he has headaches above the right eye. One brother is an epileptic.

I cite this case to mention the problem of epilepsy. I feel that if any members of an epileptic family show any abnormal traits, especially if they are of a poor type, they should be rejected. One is rash when considering that Julius Cæsar and perhaps Napoleon suffered from this disability.

The figures for this examination show that 3% of the lowest 10% could be rejected for overseas service. Probably in the next group, "low average" (23½), a further 1% or 2% of psychologically poor material would be uncovered to make up the percentage obtained by examination of unselected recruits.

The results of questioning the higher scoring groups is not recorded, because up to the present lack of time has made this impossible. Although one would expect to find potential psychiatric material, its significance is less, because the breakdown would usually follow more severe stress and the response to treatment is much better than in the group detailed above. Moreover, the value of these men's service fully recompenses the cost of their repatriation.

A Survey of Histories of Repatriated Men.

Despite the wealth of literature on nervous disorders arising from the last war, very little consideration has been given to those aspects needed for the institution of preventive measures at the present time. One would especially like accurate figures on the incidence and importance of different mental types, how each man of such a type reacted to war strain, and which types of men warranted military training.

To see if any light could be thrown on these problems, a number of records of repatriated men with nervous disorders attributable to the last war were examined. In all of them symptoms such as headache, dizziness, indigestion, backache *et cetera* are ever present. In some they were present at the time the man was discharged from the army; in others they came on gradually one by one as the years rolled by, long after active service had ceased. One would expect their very prevalence to have some correlation with the frequency of similar symptoms in apparently healthy troops. As I have shown, these very symptoms are present in at least 3% of men undergoing training.

There is too often satisfaction in the recording of such terms as "headache", "dizziness", which superficially have meaning; but only a careful elaboration of their nature gives them their true import. This is particularly desirable in psychiatric states, because only this analysis allows these disorders to be classified into their true categories.

It was impossible to arrive at any conclusions as to the value to the war machine of men with the various mental states, because very few of these records have any information as to the pre-war history and the intellectual ability of the pensioner under survey. It would seem, therefore, that men constantly afflicted with these symptoms are of as little use in the Army as they are in the ordinary life of peace time.

Conclusions.

These surveys rapidly substantiate our previous suppositions. Admittedly, the figures on which they have been made are not large; but I should be surprised if a large series of cases did not substantiate them. Similar results occur whenever neuro-psychiatric examinations are made. One series of American figures shows that when recruits passed by local boards are further assessed by a board of specialists, the latter reject 20%, and of this number no less than one-quarter are rejected for neuro-psychiatric disabilities.

Basic Difficulties in Applying the Theoretical Considerations.

One can therefore say that at present there is little attempt to incorporate any of the desirable principles formulated earlier. Before practical methods are considered, there are certain basic difficulties. Firstly, there is the nature of the psychiatric examination. This is mainly by interrogation and is often a slow process. This means that it cannot be completed so quickly as other parts of the examination. There are no satisfactory short cuts like X-ray examination *et cetera*.

Secondly, there is the number of available psychiatrists. In the United States of America it has been deemed advisable to appoint one psychiatrist to every 3,000 to 5,000 troops in addition to those assisting and lecturing to the recruiting boards in each such centre. The need for more men to do this type of work is urgent, but will have its appeal only when adequate compensation is made for its difficulties and limited turnover.

A third local problem is the expense of training a man, sending him to and returning him from (usually) distant theatres of war. For this reason particular attention is required for men being sent overseas.

Lastly, the need for careful assessment of the mental state becomes more urgent because the diminishing pool of man-power, together with the increased mechanization and individualization in the Army demands the full utilization of each individual. This applies not only to the fighting services, but to the home front. The absorption of poorer types into the industrial machine must bring in its wake increased accidents and compensation problems.

A Practical Plan to Suit Local Conditions.

It would seem that this problem might most easily be solved by alterations at the recruiting centre. Many

improvements could be suggested; but the inherent defects of the present constitution of boards make them of doubtful worth.

The best solution would be the institution of permanent boards with a reference panel of full-time specialists. These boards would be directly responsible for recruiting; they could receive instruction on various problems like flat feet *et cetera*, and they could examine men invalided from overseas to learn of errors that they might have avoided. Moreover, accepted recruits who have been found wanting by the military authorities after a period of training could be referred back for review. Here would be a capable machine for dealing with these problems.

In the meantime the following procedure is being instituted at the main camp absorbing recruits for the Australian Imperial Force. After entering camp the recruits are subjected to the group psychological test and the individual *questionnaire* test. It would have been desirable for the questions in the latter to be asked by a psychiatrist. This is not possible, so a suitably trained lay person does it. I shall refer to this man as the assistant.

From a study of these two tests a large portion of psychologically unfit men is sifted out. These men are then interviewed by the psychiatrist. The obviously unfit will be either discharged or given positions in keeping with their abilities. The doubtful ones will undergo further training and be reexamined after six weeks, when the progress reports from their officers will be available.

The personnel required for this plan is a psychiatrist, a psychologist and an assistant. The last-mentioned not only applies the *questionnaire*, but because he lives in the camp he is able to watch the men's progress and gain any information that is desired. He is really the social worker of an ordinary psychiatric unit.

This set-up also allows men whose records in the earlier testing were satisfactory, but whose subsequent camp conduct was undesirable, to be referred to it by the officers for further opinion.

Let us now see how such a scheme measures up to our ideal system.

1. To exclude the obviously unfit men. Until definite psychological standards are laid down, the question "obviously unfit" will have to be decided by the psychiatrist in conjunction with the military officers. The scheme will sift out most mental defectives and others with gross nervous abnormalities. Examples given earlier hint at types of men who should be rejected.

2. To place men only in a position in keeping with their capabilities. The psychological test helps in the rapid selection of those men with more than average intelligence, and then by personal interview it is decided whether they are capable of being trained as officers. The majority of this group are, however, "average" men. Only a large staff could adequately assess them. At the same time a record of this testing and of any other features like anxiety trends could be made on these papers. At present our main intention has been to deal most carefully with the poorer types.

3. To consider disabilities in relation to the usefulness and the mental calibre of the man. Under the present scheme this group is not seen. The men would be examined only were this procedure carried out at the recruiting centre.

4. To exclude apparently sound men who will break down under service conditions. This is difficult, not only from the psychiatric aspect, but also in the persuading of military men that such recruits should not go overseas.

Comment.

One is constantly reminded of the logical argument of politicians when confronted with pension requests, that all men passed for service are fit, and so their disability must be due to war service. This applies to physical as well as to nervous disorders. I have endeavoured to show that on theoretical and practical considerations such arguments are based on very insecure grounds. It is only when the immensity of the problem is realized that practical measures will be taken to cope with it, just as we now see our streets filled with the results of "A.R.P." measures. When this stage is reached, we can then proceed to discuss in more detail the purely psychiatric aspects of this problem.

There is a saying: "The army marches on its stomach." It may be interpreted as a compromise between the significance of the head and that of the feet in military matters. From the consideration now given to the lower extremities, we can almost say: "By their feet ye shall know them."

We can look forward to the day when our views turn in the opposite direction. We shall then know that men with the greatest gifts will guide our affairs, and each of us will have a place in keeping with his abilities. There will then be no criticism of the planners of our strategy nor of the unwieldy military machine at their disposal.

Summary.

1. Neuro-psychiatric disorders form the smallest group of causes for rejection at recruiting centres.

2. Surveys tend to show that 10% of recruits require psychological investigation.

3. Probably 3% to 5% of recruits are mentally unfit for overseas service.

4. A possible method of dealing locally with this problem is outlined.

Acknowledgement.

In psychiatric practice most illnesses are of many months' duration. There is seldom an opportunity to exercise preventive measures. When I was asked by Colonel Talbot, Deputy Director of Medical Services, Northern Command, to institute psychiatric examinations at recruiting centres and camps, I welcomed, despite its difficulties, the opportunity of showing the prophylactic value of work in this field. I welcomed his ready assistance in facilitating these investigations and the help given by him and by many others at the various centres visited for this purpose.

At the same time, my thoughts are tinged with regrets, like those of many others dealing with military matters, that the set-up of this organization makes the adoption of apparently worthwhile measures extremely difficult.

Reports of Cases.

THE INTRAPERITONEAL APPLICATION OF SULPHANILAMIDE: A REPORT OF TWO CASES.

By R. LINDSAY DOUGLAS, M.B., B.S.,
Tamworth, New South Wales.

THE following are two cases illustrating what favourable results may be expected from the intraperitoneal use of sulphanilamide. Appendiceal peritonitis and more especially intraperitoneal rupture of the bladder have been conditions attended by a high mortality rate; these cases were characterized by rapid recovery and freedom from complications. The ready-made powder in cartons containing 15 grammes was used; it was not sterilized.

Case. I.

At 7.30 on the evening of November 18, 1941, Mr. J.N., aged forty-two years, was brought to the hospital in the ambulance in a profound alcoholic state, with a shallow wound two inches long in the suprapubic region and no other obvious lesions. The wound was sutured and catheterization was attempted, as he complained of inability to pass urine. Catheterization failed; the man was known to have prostatic calculi. As there was no bladder dulness he was returned to the ward without further attempt. He had sustained the accident, the ambulance man relates, while riding his motor bicycle.

The next day, November 19, rigidity and tenderness were present over the whole abdomen, and bladder dulness was still absent. Laparotomy was performed at 11 a.m., seventeen hours after the accident; spinal anæsthesia with "Percaine" and "Neo-synephrin" was used. Two or three pints of bloody urine, somewhat purulent, were sucked out of the peritoneal cavity; the bladder had ruptured at the fundus. It was sutured, and 12 to 15 grammes of sulphanilamide were roughly distributed through the lower part of the peritoneal cavity; 7 to 10 grammes were placed in the cave of Retzius and the abdominal wall during closure. The lower end of the skin wound only was drained with gauze. A metal catheter was left in the bladder through the urethra and connected to a drainage bottle.

After operation sulphanilamide was given by mouth also (two tablets every four hours); no vomiting and no rise of temperature above 100° F. occurred after the operation. Urine drained from the wound, but healing was fairly rapid. At the time of writing (December 21), just over a month after operation, there is a small opening in the middle of the mid-line wound scar which discharges a little urine. The patient is to undergo prostatectomy in the near future; he has been up and about for two weeks.

Case II.

P.L., a boy, aged eight years, became ill on the night of November 12, 1941, with abdominal pains; this prompted the mother to give the child a dose of oil. He was somewhat better next day, but on November 14 he became worse again. On November 15 the mother brought the child to see the doctor for the first time since the illness had begun. He had a severely toxæmic appearance, with a tumid abdomen and tenderness in the right iliac fossa. He also had diarrhœa at this stage.

At operation that morning pus squirted out of the abdomen under high pressure. The peritoneal cavity was full of pus; the pus was sucked out and retrograde removal of a retrocaecal perforated appendix was performed. A large amount of sulphanilamide powder was placed in the peritoneal cavity, especially in the appendiceal area. The abdomen was closed with tube drains in the right paracolic gutter and pelvis and a rubber glove drain in the wound itself. *Clostridium welchii* antiserum (10,000 units) was given on the child's return to the ward. Vomiting was moderately severe for the first three days, but a fluid balance was maintained with fluids given by mouth. No sulphanilamide was given by mouth or otherwise after operation. A profuse discharge of blood and pus from the drainage tubes persisted for the first twenty-four hours only. The incision wound was healed when the sutures were removed a week after operation. The stab wounds had healed within a further week. Four days after operation the boy looked as well as ever; a rise of temperature up to 101° F. was noted on the day of operation and the next day; slight pyrexia persisted to the tenth day after operation. He was sent home on the nineteenth day after operation (December 4), completely well.

Acknowledgements.

I wish to thank Dr. E. B. Fitzpatrick, Dr. J. L. Watt and Dr. T. S. Douglas for permission to publish these cases.

Reviews.

A TEXT-BOOK OF SURGERY.

ROMANIS AND MITCHINER'S well-known surgical text-book has just entered its seventh edition and has maintained its high level of excellence.[1] The fact that it is only four years since the last edition speaks well for the popularity of this work. It takes the same form as the previous editions and is well bound and produced in spite of what must have been difficult conditions for the printing trade. Some out-of-date material has been deleted and a few special chapters, notably one on special war surgery, have been added.

The first volume deals with the general aspects of surgery; it has been in part rewritten, an admirable section on blood transfusion has been included, and some new illustrations have been added. Specific diseases are dealt with concisely and in the main accurately, although it is surprising to see stated the old belief that leprosy may have some relation to the eating of badly cured fish, while under bilharzia one must point out that this disease does not occur east of Suez and that *Bilharzia mansoni*—an essentially African disease which is not mentioned—is just as important as *Bilharzia hæmatobia*. The chapter on gangrene is excellent, that on tumours is diffuse, and at times the pathology is a little out of date, while infections of the hand could be dealt with more fully with advantage. There is still a large section devoted to archaic methods of arterial ligation which are relatively useless except as an anatomical exercise. A few good illustrations here of the modern methods of full exposure of arteries in the various important sites would be much more valuable. The sections dealing with bone and joint disease are good, and include all that is necessary for the student. The special section on war surgery is frankly disappointing and should and could be easily amplified with great benefit to the work as a whole.

The second volume contains some alterations which are an improvement, particularly in the chapters devoted to cleft palate, sympathetic surgery and the special senses—the last mentioned being very good. Under diseases of the thyreoid one would have preferred a little clearer distinction between the nodular toxic goitre of middle age and the younger primary varieties of thyreotoxicosis of the Graves type, while the adherence to the use of the indeterminate term parenchymatous is as unnecessary as it is out of date. As is to be expected, diseases of the breast, tongue and lung are excellently dealt with, while those sections on diseases of the alimentary canal have been modernized. A little more insistence on the great value of fluid therapy and the maintenance of an accurate fluid balance in abdominal surgery would improve this part of the book. Altogether, the special sections in this volume are succinct, well illustrated and adequate.

Although it is understood that the work is meant to portray the practice of a great London hospital, we still believe, as stated in a previous review, that it would be a great advantage to all students of medicine if more allusions were made to workers elsewhere, special reference being made to those great surgeons who have really added to the science and art of surgery; while a small bibliography at the end of each chapter, with references to classical monographs, would interest and encourage students to enlarge their horizon by reading.

This text-book has maintained its high level of excellence, has been improved till it is one of the best extant, and it can be confidently recommended both to graduates and to undergraduates.

DISEASES OF THE NOSE, THROAT AND EAR.

THAT "Diseases of the Nose, Throat and Ear", by I. Simpson Hall, lecturer in oto-rhino-laryngology, University of Edinburgh, has found such favour as to call for a second edition, is evidence of the useful place filled by this compact volume as a text for medical students and practitioners.[1] The second volume is larger by twenty-three pages than the first edition, and there are several additional illustrations, some in excellent colour. It is regretted that the needs of the general practitioner for a fuller description and illustrations of the commonest operations which he may be called upon to perform have not been better met. Tonsillectomy, either with the guillotine or by dissection, the removal of adenoids, and the operation of *paracentesis tympani* could not be properly undertaken by anyone who had merely read the descriptions outlined. To meet this purpose some sacrifice of the more extensive explanation of frontal sinus and mastoid operations might well be made. As an aid to the preparation for undergraduate examinations the work will continue to fill a most useful place, and author and publishers alike are to be congratulated that, midst the stress of war, time and materials have been found again to meet the needs of scientific education.

[1] "The Science and Practice of Surgery", by W. H. C. Romanis, M.Ch., F.R.C.S., F.R.S., and P. H. Mitchiner, C.B.E., M.S., F.R.C.S.; Volume I: General Surgery; Volume II: Regional Surgery; Seventh Edition; 1941. London: J. and A. Churchill Limited. Crown 4to, pp. 905 (Volume I) and pp. 1067 (Volume II), with 810 illustrations. Price: 15s. net each volume.

[1] "Diseases of the Nose, Throat and Ear: A Handbook for Students and Practitioners", by I. S. Hall, M.B., Ch.B., F.R.C.P.E., F.R.C.S.E.; Second Edition; 1941. Edinburgh: E. and S. Livingstone. Crown 8vo, pp. 462, with 74 illustrations and 4 coloured plates. Price: 15s. net.

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Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

CHEMOTHERAPY AND WOUNDS.

SPECIALISM in medicine is both convenient and necessary. Not only the complexity of medical science demands it, but also the preference of the practitioner—a man generally specializes because he is attracted to a subject and as a rule his success is a measure of his keenness. When a practitioner joins one of the three medical services in the defence forces, he is generally given work for which he is best suited. Those controlling the services would be foolish to adopt any other practice. At the same time work of a special kind is not always available; it comes in fits and starts, even more than it does in civil practice. It therefore follows that however well qualified an army medical officer may be in one sphere, he must be prepared to undertake at short notice any kind of general medical work. Men in the services do not always realize this and are apt to chafe at being allotted to duties outside their usual sphere. They will have reason to complain only if work that they are specially qualified to do is available and they are passed over in favour of someone with no special training. This can quite obviously be carried into civil practice at the present time. In the present circumstances it is clear that any medical man or woman may be called upon suddenly to attend to injured persons. The treatment they will have to give may be little more than first-aid treatment, but this is not certain, and in any case they should know what the modern treatment of wounds means—the why, the when and the how. A great deal has been published in this and other journals on wound treatment and many special treatises have appeared, but some recent papers should be brought to the notice of readers of this journal.

In the Kettle Memorial Lecture delivered at the Welsh National School of Medicine last May, A. A. Miles, who is professor of bacteriology in the University College Hospital Medical School, said that the bacteria introduced into wounds by direct enemy action were much less disabling in the sum total of their after-effects than those introduced after infliction.[1] Miles was trying to show how the bacteriologist contributed to the study of wound infection. He pointed out that the cultivation of swabs from wounds soon after their infliction yields mainly spore-bearing microorganisms and indifferent cocci. The cultivation of swabbings taken from four to twelve or from thirteen to thirty days later shows that the spore-bearers and the indifferent cocci die out and there is an increasing incidence of pathogenic streptococci and staphylococci and of "those junior partners in the pyogenic axis", the coliform organisms. These organisms may have been introduced at the time of wounding or have been added later. Miles discusses these alternatives; the evidence points to the later introduction of pyogenic organisms, and thus to the view that Miles holds. The organisms which instigate gas gangrene are described by him as essentially saprophytic bacilli. They include *Clostridium welchii*, *Clostridium sporogenes*, *Clostridium septicum*, occasionally *Clostridium œdematiens* and a host of more or less well-defined species, all spore-bearing anaerobes. Miles calls them saprophytic because in most wounds they die out as rapidly as other contaminants such as *Bacillus subtilis*, sarcinæ and micrococci. "In a minority of wounds they multiply with other bacteria in a superficial layer of necrotic tissue, but it is only in a few wounds so infected that gas gangrene supervenes. The opportunity for the offensive germination of the gas gangrene bacilli is provided by areas of tissue, usually those denuded of oxygen, in which the reducing intensity, chemically speaking, is increased to a point that allows the growth of anaerobes, and this opportunity is largely removed by clearing from the wound foreign bodies, dead tissue, and anything likely to kill the remaining healthy tissue." The dominant role of the streptococcus in what Miles so aptly calls the pyogenic axis has recently been emphasized by B. K. Rank,[2] who reports from an Australian general hospital abroad that of 172 wounds examined at the base hospital after the patients' admission, 63% carried hæmolytic streptococcal infections. The War Wounds Committee of the Medical Research Council of Great Britain, of which A. A. Miles was a member, stated in an interim report[3] that 70% of the wounds in a hospital ward in Great Britain were infected with *Streptococcus pyogenes*. It is also interesting to note that in his "Official History" of the 1914-1918 war A. Graham Butler describes pyogenic infection from staphylococci and streptococci as the soldier's "Public Enemy Number 1". Clearly variations in the type of infection will occur, and these variations will depend on many factors. An example may be quoted. Julian Smith, junior, has reported that among 1,500 battle casualties treated in the Syrian Campaign there were only seven cases of gas gangrene.[4] The seven cases that did occur were all established infections when the wounded men reached the casualty clearing stations. He attributes this low incidence to the introduction of powdered

[1] *The Lancet*, November 1, 1941.
[2] *The Australian and New Zealand Journal of Surgery*, January, 1942.
[3] *The British Medical Journal*, December 21 and 28, 1940.
[4] *The Australian and New Zealand Journal of Surgery*, January, 1942.

sulphanilamide into the wound. This is a most happy result and one on which every medical officer concerned should be congratulated. But there is need to walk with caution. H. R. G. Poate in an editorial in the journal containing Julian Smith's article points out that valuable as such reports undoubtedly are, they must be looked on as the experiences of individual surgeons and are not necessarily to be accepted as providing material from which general conclusions can be drawn. It must not be assumed, he writes, that the results obtained by Julian Smith in the preventive treatment of gas gangrene would be obtained in any theatre of war. The kind of country over which the action has been fought has a bearing on the incidence of gas infection of the tissues. "In the present war reports from several sources in the Middle East have shown that gas gangrene occurs more readily after a heavy downpour of rain. It would be unreasonable to expect the incidence of this type of infection to be the same in the Western Desert as, for example, in country like Malaya or in a terrain such as the churned up fields of Flanders of the last war."

Turning to treatment, we find that all surgeons writing of their experiences abroad are enthusiastic regarding the use of sulphonamide compounds in the treatment of war wounds. At the outset reference should be made to a report published by L. E. Glynn, of the Department of Morbid Anatomy, University College Hospital Medical School.[1] Glynn has made an experimental investigation into the effects of sulphanilamide, sulphathiazole and sulphapyridine on the development of granulation tissue and their toxic action on striped muscle. Previous investigators had shown on the one hand that powdered sulphanilamide and sulphapyridine inflict no damage on the brain and on the other that the oral administration of sulphanilamide to dogs with experimental wounds produced a pronounced inhibition of the fibroblastic response. Glynn found that a slight, barely significant inhibition of fibroblast proliferation was produced by sulphathiazole and sulphapyridine, but not by sulphanilamide. Sulphanilamide and to a lesser extent sulphapyridine had a slight but definite toxic action on striped muscle. At the same time neither the toxic action nor the fibroblastic inhibition was sufficient to contraindicate the local application of these drugs. The result of this investigation is chiefly of academic interest—the clinical results of the application of the drugs in question have been so striking that experimental findings would need to be particularly damning to bring about a reversal of practice. The latest details of chemotherapy in war wounds come from Julian Smith whose paper has already been mentioned. Every wounded man was given four tablets or two grammes of "M & B 693" on his admission to the unit and this dose was followed by one gramme given every four hours. In some field ambulances an initial dose of five grammes was given and in some base hospitals a daily dose of the same size was given. Julian Smith remarks that there is no doubt that the single daily dose solves a domestic problem of no small order, when in a casualty clearing station the drug has to be given to a large number of patients by a limited staff. The effectiveness of sulphonamide compounds depends on the concentration of the drug in the blood and in this regard readers should be reminded of the important paper by Roderick Andrew published in this journal last November. Andrew found that administration every twelve or twenty-four hours was practicable for immediate prophylactic use and during the evacuation of casualties. This brings us to another point raised by H. R. G. Poate in his editorial—whether oral administration should be used as well as local application. He remarks that most observers recommend it. There seems to be no doubt what the decision should be. Surely as many guns as possible should be brought to bear on the position that is being attacked. In support of this contention is the fact that with sulphanilamides there is, to quote the import of an observation by Miles, in the presence of inflammation experimentally induced by toxin no fixation or exclusion of the circulating drug as there is with antitoxin. Presumably, he states, the molecule is small enough to be independent of the peculiar features of the inflammatory lesion; it penetrates wherever it can diffuse, either from a deposit of solid drug or from the circulation.

The articles that have been mentioned are commended to the study of all practitioners to whom they are available.

[1] *The Journal of Pathology and Bacteriology*, September, 1941.

Current Comment.

LOSS OF CONSCIOUSNESS IN HEAD INJURY.

THIS war, like that of 1914-1918, has in the welter of illness and injury that are inseparable from it, given medical workers first-rate opportunities for clinical and pathological investigation. Kenneth Eden and J. W. Aldren Turner have seized the opportunity to study the effects on consciousness of penetrating wounds of the brain.[1] During the last eighteen months of war they have studied the amnesia in 200 cases of head injury of all types in patients admitted to Haywards Heath Neurological Centre. They insist that there are misconceptions regarding the effect on consciousness of varying kinds of head injury and refer to a statement by Munro in 1938 that any significant cerebral injury, in the sense that it is confined to the brain in contradistinction to the skull and meninges, is always initiated by some degree of unconsciousness. Their 200 cases certainly show that this contention is not correct.

Before any account of Eden and Turner's observations is given it must be explained that by the term "retrograde amnesia" they mean the interval of time between the last clearly remembered incident and the time of the accident. They apply the term "post-traumatic amnesia" to the period of unconsciousness following the accident; it is estimated from the moment of injury to the first return of consecutive consciousness. It is rarely so absolute as the retrograde amnesia and may be punctuated by fragmentary memories of incidents. Eden and Turner divide their cases of head injury into four groups: (*a*) closed cerebral injury with or without fracture, (*b*) scalp wounds without fracture, (*c*) open cerebral injury (due to penetrating metal splinters) divided into superficial and deep, (*d*) compound fractures due either to massive violence or to projectiles which do not penetrate the brain. At first sight this grouping may seem arbitrary and there may appear to be some overlapping; but the way in which the cases are discussed by these authors shows that this is not so.

In discussing closed cerebral injury, Eden and Turner point out that the period of unconsciousness resulting

[1] *Proceedings of the Royal Society of Medicine*, September, 1941.

from a massive blow on the head is called concussion, and this, they state, was defined by Trotter as "an instantaneous loss of consciousness, which is recoverable, and is not caused by any constant gross pathological changes". Trotter described concussion as essentially a transient state, lasting a few seconds or minutes. Eden and Turner's definition is badly expressed. Concussion can never be regarded as a period of unconsciousness. It is a disturbed condition of the brain caused by external circumstances and leading to a period of unconsciousness. If we keep this in mind we can follow the argument put forward by these two authors. Incidentally we would express doubt as to the definition attributed by them to Trotter; we cannot believe that Trotter would define concussion as a loss of consciousness. Trotter was above all a clear thinker. In Eden and Turner's group of closed cerebral injury there were 98 cases. The post-traumatic amnesia in 25 of these cases lasted for minutes, in 42 cases for hours, in 19 for days, and in eight for weeks. In many of these cases there were no signs of focal damage. When focal signs such as hemiparesis, hemianopia or aphasia with blood staining of the cerebro-spinal fluid were present, the patient was said to suffer from cerebral contusion. This is regarded by these authors as being a bruising of the brain occurring principally near the area of skull struck or at the opposite pole from *contre-coup* violence. As a rule the amnesia of cerebral concussion and that of contusion in closed injuries of the brain are inseparable; but Eden and Turner quote the history of a case in which focal contusion occurred without concussion. In this instance exploration with a needle through bilateral trephine holes and ventriculography excluded the presence of intracranial hæmatoma. The syndrome of focal contusion without concussion is not uncommon in association with minor scalp wounds due to projectiles; one such case is quoted in detail.

Of the open cerebral injuries due to the penetration of foreign bodies, 27 were classified together because the foreign body was superficial, and 14 were grouped together because it was deep. In ten of the 27 cases there was no loss of consciousness, and many patients had only a brief retrograde amnesia. No decision could be arrived at as to whether the size of the fragment or the place at which it pierced the cortex determined the loss of consciousness. It seemed probable, however, that when immediate unconsciousness occurred, it was caused not by penetration of the missile, but by the superadded effect of a massive blow on the skull. When the missile was carried deeply into the brain prolonged unconsciousness was the rule; nine of fourteen patients died in coma. Eden and Turner state that it is uncertain to what extent hæmorrhage and infection determine the result; but they think that the distribution of the swelling in the base of the brain is significant. Perhaps it is, as they state, difficult to speculate on these factors without further information. At the same time, since it is fairly clear that the lesion caused by the foreign body is significant in the deep wounds, it seems unreasonable to agree, without definite evidence to the contrary, that the lesion would have no significance if it was superficially situated. The group of compound fractures without penetration of the brain included 49 cases. These 49 were further subdivided into four groups. The first of these comprises fractures caused by massive violence, such as road accidents and heavy falls; these cases are similar to those in the group of closed cerebral injuries, and the effect on consciousness is the same as in that group. The second subgroup comprises fractures due to low velocity projectiles; most were depressed fractures, and ten out of eleven patients had no amnesia. The third subgroup included fractures caused by a missile whose nature could not be determined. The missile was probably heavy fragments of masonry, and it is not surprising that the majority of the patients had concussion. The last subgroup is of interest because of our recent reference to flying glass. Three cases were included in this subgroup; in these there was a severe blow on the head from numerous fragments of flying glass, some of which pierced the skull and lodged in the bone. The effect on consciousness was that of a massive blow from a heavy object with resulting concussion and contusion.

Eden and Turner conclude that they have shown in their paper that there are two possible effects on the brain of a blow on the head. The first, concussion, "is an instantaneous but transient period of unconsciousness, usually with retrograde amnesia, and unassociated with other signs of damage to the brain". The second, contusion, "is characterized by localized signs of brain injury, blood staining of the cerebro-spinal fluid, and in some cases only, unconsciousness, which may be delayed in onset for several minutes or hours". In concussion the force is transmitted through a large part of the skull and makes itself felt on the brain as a whole. The factor which most of all determines this "generalized shaking-up effect" on the brain is the size of the object striking the skull or the surface area involved in the injury. Concussion does not follow a small localized impact. Contusion, which is a bruising of the brain, may occur with all types of injury.

An added interest is given to Eden and Turner's paper by the results of another investigation which have been published. D. Denny-Brown and W. Ritchie Russell apparently read a paper on the same occasion on which Eden and Turner read theirs, for an abstract is published after the latter contribution. The full paper is published elsewhere.[1] The work of Denny-Brown and Russell is really a monograph and covers more than seventy pages. They have made an experimental investigation in order to try "to define concussion more closely", and the report is a scholarly presentation of their findings. They mention at the start Trotter's reference to concussion, and quote him correctly from *The Lancet* of May 10, 1924, page 935. Trotter used the term concussion in what he called its strict classical sense "to indicate an essentially transient state due to head injury which is of instantaneous onset, manifests widespread symptoms of a purely paralytic kind, does not as such comprise any evidence of structural cerebral injury, and is always followed by amnesia for the actual moment of the accident". After having discussed them, they point out that all hypotheses to explain the mechanism of concussion by any other means than direct damage to the nerve cell return to a postulate of primary vascular alteration of which there is no direct evidence. "Hypotheses based on disturbance of vascular supply rest on a highly theoretical basis though they raise important therapeutic issues in relation to œdema and congestion. The remaining hypothesis of molecular, intracellular disorder is unsatisfying in its abstract terms and lack of relation to any specific function or structure." Denny-Brown and Russell planned that in their experiments they should cause concussion by subjecting the animal's head to a sudden change of velocity. They therefore arranged that it should receive blows from a pendulum at a given speed and momentum; the details need not be given. Pure concussion could readily be produced by subjecting the animal's head to a sufficiently high rate of change of velocity (acceleration concussion). This is a direct traumatic paralysis of nervous function without vascular lesion. A lesser degree of change causes momentary depression of function; a greater degree prolongs the phase of paralysis before recovery occurs. Concussion produced by a crushing injury, striking the head while it is supported on a hard surface (compression concussion) requires a much greater force than is required by acceleration concussion to produce the same result, and the mechanism by which concussion results is somewhat different. Compression concussion requires an extreme crushing injury or penetration of the skull by a relatively large object. We do not propose to follow the findings of Denny-Brown and Russell any further; the subject is sure to appeal to those whose special interests take them into this sphere, and they will find in this monograph a great deal to stimulate their interest. It must suffice to state that the investigations point to the conclusion that concussion is the direct effect of physical stress on neurones and that contusion is the effect of stress on supporting vascular structures.

[1] *Brain*, September, 1941.

Abstracts from Medical Literature.

BACTERIOLOGY AND IMMUNOLOGY.

Diagnosis of Virus Infections of the Central Nervous System.

J. Casals and R. Palacios (*The Journal of Experimental Medicine*, November, 1941) have made an extensive study of the complement fixation test in the diagnosis of virus infections of the central nervous system. The isolation of an increasing number of neurotropic strains of virus made a rapid diagnostic test of the human encephalitides of some importance. The chief problem of the workers was the preparation of a satisfactory antigen which would not become anticomplementary, and the standardization of the conditions of the test. They found that a saline extract of infected mouse brain, after being several times frozen and thawed, could be preserved with merthiolate, stored in the ice-box, and used undiluted for a considerable number of months with the development of little anticomplementary action. They used guinea-pig serum as a source of complement, a sheep red cell hæmolytic system, and performed the tests at 37° C. A large series of tests were carried out on immunized animals, and it was found that inactivation of the test serum had to be carried out at different temperatures in different species of animals. Then the authors applied the test to the serum of human beings who had suffered from attacks of virus disease at periods up to two and a half years before. Complement-fixing antibodies, specific for the particular virus disease from which they had suffered, were found in significant titre, although in lymphocytic chorio-meningitis and St. Louis encephalitis they were present only for a short time after the illness. The method seems rapid and reliable, and the authors believe that it should be of clinical value in diagnosis.

Gonococcus and the Chick Embryo.

Frederick Bang (*The Journal of Experimental Medicine*, October, 1941) has studied the effect on the chick embryo of nine strains of gonococci. In one series of experiments the organisms were inoculated onto the chorio-allantoic membrane, in another into the amniotic cavity. In this series the appearances were contrasted with those of similar experiments in which the meningococcus was used. In the first series the infections which developed were frequently localized, phagocytosis was often marked, cellular exudate and pus formation preceding healing. In those in which death of the embryo was caused, thrombosis of the vessels and but little phagocytosis occurred. The addition of an immune serum prepared in adult fowls did not help phagocytosis. Intraamniotic inoculation was performed in older embryos, and only 14 out of 41 eggs showed a reaction to infection, the lesions being chiefly pneumonitis and bronchitis, while in one meningitis occurred. Gonococci could always be recovered from the amniotic fluid. Many of these embryos recovered from the infection and were later hatched. If meningococci were used, the number of fatal results and the incidence of purulent meningitis were much higher. The author describes observations on the pathology of acute urethritis in a patient accidentally killed three weeks after infection with the gonococcus. Organisms were present in the columnar epithelial cells and phagocytosis was found, both findings being similar to those noted in the embryos.

Blastomycoides Infection of the Central Nervous System.

Rebecca A. Holt (*The Journal of Laboratory and Clinical Medicine*, October, 1941) has reported the identification of *Blastomycoides histolytica* in three infections of the central nervous system. Two patients were diagnosed as suffering from meningitis and one recovered; a third was thought to have a brain tumour. In all three the yeast-like organism was grown in culture on blood agar and on Sabouraud's medium, and mice injected with two strains intraperitoneally developed lesions in brain and viscera. The lesions were gelatinous and cyst-like, and contained the typical organisms. A subsequent visit to hospital for observation of the patient who recovered showed that the organisms could still be recovered from the spinal fluid and that they were present in the urine.

Film Cultures of Tubercle Bacilli.

D. M. Pryce (*The Journal of Pathology and Bacteriology*, November, 1941) has elaborated a micro-method for the rapid cultivation of *Mycobacterium tuberculosis*. Films of sputum were prepared on glass, treated with acid to kill other organisms, and incubated in contact with hæmolysed human blood. Acid-fast bacilli were transformed into colonies in a matter of days, and could be stained by the Ziehl-Neelsen method and examined under the low power of the microscope. The cellular elements of the sputum disappeared, and long trails of bacilli, some showing branching, could be seen. One organism was isolated from a caseous lesion in a cow. This was assumed to be a bovine strain. The author is reporting rapid technique, and proposes to submit his results to further study.

HYGIENE.

Therapeutic and Prophylactic Detoxication—Anthelmintics.

Gustav J. Martin, Marvin R. Thompson and N. J. Accousti (*American Journal of Hygiene*, September, 1941) state that as a large proportion of human beings harbour one species or another of worms, anthelmintics are in common use and mass treatments are often tried. All are more or less toxic—ascaridole (oil of chenopodium), aspidium (male fern), carbon tetrachloride and tetrachlorethylene. The detoxifying action of the liver is usually effective, but every now and then fatalities occur. The authors have studied toxicities in 4,000 mice. Ascorbic acid, glycine, glycuronic acid, cystin and probably choline proved the most effective detoxicating agents and are non-toxic in themselves. A mixture tends to be more useful than any single drug. The process is thought to be non-specific and one of conjugation rather than oxidation or reduction. Gum tragacanth was used in the tests, as gum arabic may contain glucuronic acid. Ascarids were the test parasites. The toxicities were reduced about 50%. The detoxicating agents may be given by the mouth while the anthelmintic is injected if desired. If ascaridole is given simultaneously, the anthelmintic effect is reduced, so that the detoxicating agents are best given a little while later. With tetrachlorethylene, however, their simultaneous administration enhanced the anthelmintic value.

Types of Diphtheria Bacilli in New York City in 1940.

Erich Seligmann (*American Journal of Hygiene*, November, 1941) reports attempts to differentiate 181 strains of diphtheria bacilli from cases and carriers in New York City during 1940. Only by the polysaccharide fermentators could five *gravis* cases be detected, and four of these produced *gravis* and *mitis* colonies side by side on plates "dissociating". Of the rest, 96 were *mitis*-like and 80 indeterminate. Nineteen of the latter were dissociating strains, a marked contrast to British findings though similar to findings in Baltimore (Frobisher). None of the *gravis* strains was avirulent but no relationship could be found between type of bacillus and clinical severity.

Reduction of Dust-Borne Bacteria by the Oiling of Floors.

John C. Thomas (*The Lancet*, August 2, 1941) describes experiments made with spindle oil applied to the floors of canteens and hospital wards over a period of months. In each case there has been a significant and prolonged reduction (about 80%) in the number of organisms projected into the air by sweeping. This reduction applies both to the common dust saprophytes and to the pathogenic streptococci. The oil can be applied to all wood floors, provided polish is removed beforehand, and to either glossy or cork-inlaid linoleum.

Immunization against Influenza and Pneumococcus Pneumonia.

Morris Siegel and Ralph S. Muckenfuss (*American Journal of Hygiene*, November, 1941) report that large scale clinical tests of the pneumococcal polysaccharide (Felton) as a prophylactic inoculation have been in progress in CCC camps since 1933. The results have suggested a lower incidence rate among those not inoculated for both homologous and heterologous types of pneumococcal pneumonia; but in other reports, from France and Baluchistan, the results have been conflicting. In New York institutions for the feeble-minded the heavy incidence among new admissions seemed unrelated to vaccination. In Letchworth, about which the authors write, in each cottage one-third of the inmates were vaccinated against pneumonia, one-third were vaccinated against influenza, and one-third remained unvaccinated. The details of patients in hospital were alone recorded. The figures for those who developed pneumonia and died from it were almost identical in the several groups. Bronchopneumonia was perhaps more often found in the non-vaccinated. In the last period observed, 1940, measles and whooping cough developed among the male group, 12·5% being affected by the former and 11% by the latter. Measles caused an increase in the number of cases of pneumonia. Leaving out infections secondary to measles and whooping cough or new admissions before the inoculation, the cases numbered 40, 42 and 39 for the three groups, and similarly in the outbreak after measles. Types I and V

were most common, though absent for three years previously. Recurrences were due to other types than that responsible for the previous attack. Types I, II and III polysaccharide did not prevent Type I pneumonia, and the authors admit the difficulty of preventing the disease by such limited measures as specific active immunization with only I, II and III derivatives.

Tuberculosis Studies in Tennessee.

RUTH R. PUFFER *et alii* (*American Journal of Hygiene*, November, 1941) have studied the household associates of 392 white and 99 coloured patients suffering from respiratory tuberculosis. Of the white patients, 23% and of the coloured 63% had tubercle bacilli in the sputum and died. To intracutaneous tests with 0·01 to 1·0 milligramme of "O.T." 86% of the white and 81% of the coloured household associates gave positive reactions. Of these reactors, 7·9% and 7·3% were found to have manifest disease. Though similar in number, the coloured patients as a rule suffered from more advanced disease than the whites. A higher proportion of infections occurred in persons under thirty-five years of age. Of the associates of persons with other types of manifest infection and latent apical infection, 51% of white and 60% of coloured associates did not react. The prevalence of latent infection is definitely lower in the closed infections. The frequency among coloured persons is lower than among the white in this type. The rapid course of the disease in coloured persons means their more rapid elimination, so that the prevalence of actual infections of tuberculosis at all ages at any given time may not be greater among coloured than among white persons.

Diphtheria in Canada.

C. E. DOLMAN (*Canadian Public Health Journal*, August, 1941) refers to the remarkable fall in deaths due to diphtheria from 24 to 3 per 100,000 from 1921 to 1939. Since 1932 the rate rose slightly to four and three in 1938 and 1939. The author states that a defection in, for instance, one province not only spoils the record of Canada as a whole, but prolongs and aggravates the hazards faced by more conscientious provinces. In Ontario the battle against diphtheria has been fought perhaps more relentlessly and successfully with toxoid than in any similar sized population group elsewhere in the world. The disease has in fact almost ceased to be a cause of death in that province. Its capital city, Toronto, with a population of over 750,000, has had not a single case of diphtheria for the past fifteen months. Two other Ontario cities, Hamilton (155,000) and Brantford (30,000) have had no cases of diphtheria for over seven and ten years respectively, while neither has had a death from diphtheria for over ten years.

MEDICINE.

Influenza A Vaccine.

G. DALLDORF, E. WHITNEY AND A. RUSKIN (*The Journal of the American Medical Association*, June 7, 1941) describe a controlled clinical test of influenza A vaccine. Four hundred and fifteen out of 826 employees of an institution were vaccinated with a complex chick embryo influenza A vaccine on December 11 and 12. Late in the January following, influenza attacked 77 employees, of whom 32 had been vaccinated. The serum of 59 patients was tested for neutralizing and complement-fixing antibodies. Serum virus mixtures (a 4% saline suspension of freshly harvested mouse lungs taken from animals injected with the PR8 strain of influenza) were instilled into the nostrils of mice which were killed on the sixth day, and the extent of lesions was noted. The vaccinated group of employees had a higher level of antibodies. These tests showed that 27 out of 31 had influenza A. The symptoms were fever, aches and pains, cough, chilliness and prostration. Signs of pneumonitis were found in twenty patients, but X-ray evidence of pneumonia in only three. *Hæmophilus influenzæ* was not isolated in any patient. Several of the patients who were most severely ill had pneumococci or hæmolytic streptococci in their sputum. Conclusions were that the vaccine increased the neutralizing antibodies, but did not prevent influenza. It may have reduced the incidence of the disease, since fewer vaccinated persons were attacked, and the vaccinated persons were on the whole less seriously ill than the unvaccinated.

Globin Insulin.

G. G. DUNCAN AND C. E. BARNES (*The American Journal of the Medical Sciences*, October, 1941) compare the action of globin insulin with that of other forms of insulin, unmodified, crystalline insulin and protamine zinc insulin. The maximum effect of globin insulin is obtained about eight hours after injection, and its effect is exhausted in about fifteen hours. Globin is a simple protein prepared from beef blood. Globin insulin was injected in the treatment of 42 patients in the authors' series. Its action was slower in reducing blood sugar in the first four hours, though its maximum effect was noted sooner than that of protamine zinc insulin. The blood sugar level reached the lowest point from the eighth to tenth hour after injection, so that when it was injected before breakfast hypoglycæmic reactions were to be looked for about 4 p.m. to 6 p.m. It was necessary to give carbohydrate later in the day to avoid reactions. Unit for unit, globin insulin had a greater hypoglycæmic effect than protamine zinc insulin. In this series of patients similar amounts of each of the forms of insulin were injected, varying from 15 to 80 units. Globin insulin gave the most prolonged effects.

The Coronary Bed in Cardiac Hypertrophy.

WILLIAM DOCK (*The Journal of Experimental Medicine*, September, 1941) has used his perfusion method, evolved for kidney experiments, to estimate the capacity of the coronary bed in cardiac hypertrophy. The results were recorded in flow in cubic centimetres per gramme of ventricular muscle per minute. Normal hearts, with ventricular weight of 150 to 250 grammes, showed a striking fall in the figures with age, 3·1 cubic centimetres at 25 to 40 years, 2·4 cubic centimetres at 40 to 57 years, and 2·0 cubic centimetres in those 60 to 84 years. The age difference is less striking when ventricular weights are high, but when hypertrophy is present there is a diminution of vascular capacity of 30% for hearts of 350 to 600 grammes, and 37% for those over 600 grammes. The author discusses the relation of this finding to ischæmia of the heart muscle and to the development of heart failure. He comments on the more frequent occurrence of degenerative changes in marked degrees of hæmoglobin deficiency than in hypertrophied and failing hearts. He thinks that the decrease in the capacity of the coronary bed does not constitute evidence that the hypertrophied heart has an inadequate oxygen supply or that it is therefore predisposed to congestive failure.

The Renal Vascular Bed in Hypertension.

ALBIN J. COX AND WILLIAM DOCK (*The Journal of Experimental Medicine*, September, 1941) have studied the capacity of the renal vascular bed in hypertension. They developed a satisfactory method for perfusing human kidneys obtained at autopsy at a pressure of 100 millimetres of mercury, using an oily fluid. They avoided the development of post-mortem rigor, and their figures were higher than those obtained by workers using saline solution, with organs obtained immediately *post mortem*. They investigated "normal controls", patients who had normal heart weights and blood pressures, hypertensives showing systolic pressures over 170 millimetres of mercury and diastolic pressures over 90 millimetres, and uræmics with a blood urea content of 100 milligrammes or over. In the normal group there was a striking fall of the capacity of the renal vascular bed with age, 25% difference existing between young adults eighteen to thirty-two years and persons sixty-one to sixty-eight years of age. In the figures obtained from hypertensive patients there were slight variations from that to be expected for their age group, but only in the uræmic group was there serious diminution in the capacity. The authors believe that their method is reliable and that the evidence they have obtained upholds the contention that renal arteriosclerosis is often a result, rarely a cause, of hypertension.

Chemotherapy and Subacute Bacterial Endocarditis.

C. E. LEACH *et alii* (*The Journal of the American Medical Association*, October 18, 1941) have reported the results of treatment of 41 patients suffering from subacute bacterial endocarditis by means of chemotherapy and heparin. Two grammes of sulphapyridine were given, followed by two grammes in two hours, then one gramme was given every four hours until the blood level reached as nearly as possible 10 milligrammes per 100 cubic centimetres. In some cases heparin was given (20 cubic centimetres per 1,000 cubic centimetres of saline or dextrose solution) intravenously at the rate of 15 to 20 drops per minute for two or three weeks. Sulphapyridine was continued for two months or more. Twenty-three patients had heparin and chemotherapy and eighteen had chemotherapy alone. In some cases sulphathiazole was given instead of or as well as sulphapyridine. A diet of high caloric value with high vitamin content, iron, ascorbic acid, transfusions and other measures were used as indicated. Permanent remissions occurred in three patients who were given heparin *plus* chemotherapy, and in one patient who had chemotherapy alone. Sulphapyridine seemed more

effective than sulphathiazole as a rule. Chemotherapy generally had a favourable influence on the fever or general health within one week if it had a favourable effect at all. Sulphamethylthiazole, sulphanilamide, neoarsphenamine and sodium paranitrobenzoate had little good effect. Temporary remissions of from one to five months occurred in several cases. Toxic effects included nausea, vomiting, dermatitis, hyperpyrexia, agranulocytosis and anæmia, and in one-third of the cases necessitated cessation of drug treatment. Sulphapyridine caused the more severe reactions. Heparin *per se* was ineffective in treatment, and the authors appear to doubt its value in the treatment of the patients who recovered, inasmuch as heparin was used only for those patients who had already responded to chemotherapy by a fall of temperature to normal range. Hyperthermia treatment was applied to four patients in addition to chemotherapy without beneficial effect.

Cardiac Pain.

R. L. Levy and R. L. Moore (*The Journal of the American Medical Association*, July 7, 1941) describe treatment of cardiac pain by paravertebral sympathetic block with alcohol. Forty-five patients were treated, all of whom suffered from severe paroxysmal cardiac pain. Needles were inserted in the upper five to six intercostal spaces, as described by White, until the point of the needle reached the lateral aspect of the vertebra or the head of the corresponding rib. Five cubic centimetres of a 1% solution of procaine hydrochloride were injected; this prevented the pain which alcohol would otherwise cause. Five cubic centimetres of an 80% solution of alcohol were then injected through each space. Of the patients, 22% obtained no relief, 47% obtained permanent relief which varied in degree. The cause of cardiac pain in the majority of the cases was coronary sclerosis. Ill effects of the injections were painful neuritis of intercostal nerves lasting for one to three months, anæsthesia or hyperæsthesia of the wall of the chest, transient pleural effusion and transient fever. In spite of marked improvement, in no case was relief from symptoms complete.

Pernicious Anæmia.

J. M. Askey (*The Journal of the American Medical Association*, September 13, 1941) describes the response to massive liver therapy in relapsed pernicious anæmia. Twenty-two patients who failed to respond to small doses of liver extract were given a single dose of 10 to 20 cubic centimetres of "Reticulogen" (Lilly) or solution "Liver extract purified" (Lilly), which contained 15 to 20 United States Pharmacopœia units per cubic centimetre. A United States Pharmacopœia unit is the amount of liver given daily which produces a satisfactory response. One hundred grammes of bovine liver contain from 10 to 15 United States Pharmacopœia units. No other liver was given during the observation period of three months. In sixteen instances the clinical and hæmopoietic response was excellent. In only three patients did the blood count fail to reach four million red cells per cubic millimetre at the end of the second month. Seven patients maintained a red cell count of over four million for three to nine months, and nine relapsed again within six months. Others have reported cases in which the blood count was kept above 4·5 million red cells by a monthly dose of liver containing 10 United States Pharmacopœia units. The massive dose is necessary only in relapse.

Hyperinsulinism.

William Magner (*Canadian Medical Association Journal*, July, 1941) reports two cases of hyperinsulinism. Both patients were treated by surgery. In the first case a single islet adenoma of the pancreas was found, and in the second case diffuse hypertrophy and hyperplasia of the islands of Langerhans. The following triad of symptoms was noted in both: attacks of syncope or gastro-intestinal disturbances coming on in the fasting state, a blood sugar reading below 50 milligrammes *per centum* during attacks, and prompt relief of symptoms following the ingestion of glucose. Reference is made to Whipple's summary of 125 cases of hyperinsulinism in which the pancreas was studied either at operation or at autopsy.

The Preparation of Thromboplastin.

T. K. Owen and M. Toohey (*The Lancet*, June 7, 1941) describe a simple procedure for preparing thromboplastin in the estimation of prothrombin. A portion of rabbit or human brain is carefully freed from membranes and blood vessels, washed, macerated to a smooth paste in a mortar, and suspended in ten times its weight of saline solution. The saline suspension is stored in an airtight screw-top bottle at 4° C. Before use it is centrifuged and the supernatant clear fluid is used in the estimation. This fluid was found to be prothrombin-free. The normal coagulation time was found to be the same as that given by Quick, namely, 11 to 15 seconds.

Chemotherapy of Intestinal Parasites.

E. C. Faust (*The Journal of the American Medical Association*, October 18, 1941) discusses chemotherapy of intestinal parasites. For amœbiasis (*Endamœba histolytica*) emetine is of value in relieving symptoms; other preparations—chiniofon, diodoquin, "Vioform" and "Enteroviоform" (iodochlor-oxyquinolin) have been lauded. Chiniofon, diodoquin and "Carbasone" (arsenical) may be used. Giardiasis (*Giardia lamblia*) infests the upper jejunum of children in the United States of America. It can be effectively treated with one and a half grains of "Atebrin" thrice daily for five days, smaller doses being given for children. Oxyuriasis responds to two half-grain tablets of gentian violet four and a half hour "Enseals" thrice daily with meals for eight days; a week's rest is then ordered and the drug is repeated. All affected members of the household should be treated. Strongyloidiasis also responds to gentian violet and one and a half hour "Enseals" thrice daily, until fifty grains have been taken. For ascariasis, "Caprokol" (hexyl resorcinol) is given in hard gelatin capsules on an empty stomach and food is withheld for four or five hours. The drug is given in doses of 0·4 gramme for small children, 0·8 to 1·0 gramme for adults, and saline purgation afterwards is more reliable than santonin. Hookworm is best treated by "Caprokol" two or three times in a week for children or debilitated persons. Tetrachlorethylene, which is less toxic than carbon tetrachloride, can be used for stronger patients. Iron and blood transfusion may be needed for the uræmia. Tapeworms can be removed by pomegranate bark, fern root, or oleoresin of aspidium, 20 minims at half-hour intervals for three doses, preceded and followed in two hours by saline purgation. Carbon tetrachloride is a satisfactory substitute. Sulphonamide preparations have not been specific in these disorders.

Sarcoidosis.

W. T. Longcope (*The Journal of the American Medical Association*, October 18, 1941) discusses sarcoidosis or Besnier-Boeck-Schaumann disease. Thirty-one cases are reported; the age incidence was between ten and fifty-one years. The lesion is a hard tubercle about the size of a miliary tubercle, composed of large pale-staining polygonal epithelioid cells; giant cells are common. The tubercles increase in number and become profuse, so as to form large pearly grey semitranslucent firm masses in the skin, spleen, liver, heart. The condition may affect any organ, like Hodgkin's disease, to which it bears some resemblance. Its cause and mode of spread are unknown. Constitutional disturbance and fever are unusual, as are loss of weight and anæmia; eosinophilia of 6% to 35% occurred in 11 of 30 cases. Symptoms are caused by the mechanical interference of the tubercles, displacing or destroying normal tissues or forming tumour-like masses in skin, eye, mediastinum, lungs, heart or nervous system. The eye is often first affected; any or all of the structures of the eye may be involved. A syndrome known as uveo-parotid fever is recognized. Involvement of bronchial or mediastinal lymph nodes was noted in 28%. In some cases X-ray examination revealed extensive infiltration of both lungs without symptoms or physical signs. Dyspnœa may occur. Tuberculosis of the lungs occurred in eight out of twenty-five cases. Myocardial failure may occur. Liver and spleen or abdominal glands may be greatly enlarged. The disease, lymphogranulomatosis, runs a slow benign course as a rule, with relapses and involvement of different organs. Hence it is likely to be confused with syphilis, tuberculosis or Hodgkin's disease. Treatment is purely empirical.

ORTHOPÆDIC SURGERY.

Treatment of Tendons in Compound Injuries of the Hand.

The repair of cut tendons is discussed by Sterling Bunnell (*The Journal of Bone and Joint Surgery*, April, 1941). The author believes that a patient with a severed tendon should be hurried to hospital, where surgical facilities and surgical skill are available. The fate of a tendon depends on the treatment of the wound and efficient repair can be accomplished by the observance of three principles: (*a*) Early operation, before germs introduced have become numerous. (*b*) Thorough *débridement*. (*c*) The covering of all vulnerable tissues. It is preferable to suture tendons within six hours of the accident. If smears contain no cocci and few pus cells, if there is little contamination by

dirt, or if no great destruction of tissue is present, an interval of twelve or the maximum of twenty-four hours' interval may be permitted. *Débridement* must be painstaking and complete, an Esmarch tourniquet and blood pressure cuff producing a bloodless field. Infected bone is chiselled thinly, and infected tendon and nerve ends are shaved off. Plastic skin flaps are fashioned from the neighbourhood to cover denuded areas, since bone, nerves and tendons cannot live if exposed. Post-operative immobility is maintained for a week by plaster of Paris, and the limb is elevated until the tendency to swell is over. Gauze pressure is applied for a few hours and then the wound is exposed and allowed to dry, protected by a wire cage only. The author discusses the healing of sutured tendons and states that in four days fibroblasts join the tendon ends. Tendon cells commence to proliferate in four days and in three weeks splints can be removed. In four weeks the danger of breaking is over. The suture material used is fine stainless steel wire, sizes numbers 34 and 35. It provokes less reaction than silk number 2. Catgut is least satisfactory. O'Shea states that the use of catgut is followed by infection six times as often as when silk is used. The author describes several methods of suturing tendons, and details a method of removing the wire after three weeks when union is complete. If the *flexor sublimis* tendon alone is cut, the tendon need not be repaired. If both *flexor sublimis* and *profundus* tendons are severed, the *profundus* only should be repaired, and the *sublimis* removed. Flexor severance in the proximal segment of the finger is the commonest tendon injury, and is followed by the poorest results.

SURGERY.

The Use of the Miller-Abbott Tube.

THE Miller-Abbott tube is an important instrument in the treatment of intestinal obstruction. But, as J. B. Blodgett (*The American Journal of Surgery*, August, 1941) points out, its value may be lost unless a correct technique is employed. Roughly, the instrument consists of a tube some nine feet long, with a divided lumen. One portion of the lumen is used for suction, while the other opens into an inflatable rubber balloon which surrounds the tube just proximal to its distal end. The principle of its use is that bowel contents can be aspirated, allowing the intestinal wall to contract down and to propel the inflated balloon right down to the site of the obstruction in the small bowel. The tube is useful in many types of obstruction, whether paralytic or mechanical, but must not be used (except during the preparation for immediate operation) where there is interference with the vascular supply of the bowel, as in strangulated hernia. The following practical points should be observed. The balloon should be replaced by a new one after each use of the tube. Half of an ordinary condom forms a satisfactory balloon. It is tied on with thread, care being taken not to tie so tightly as to obstruct the lumen. A trial should show that the portion of the tube within the balloon does not kink when the balloon is inflated. Tests should be made for leaks in the balloon. The tube is passed through the nose with the bag deflated and lubricated with mineral oil. Cocainization of the nose may be necessary. Before the passage of the tube an estimate is made of the length that will need to be passed in order that the tip will lie in the pyloric antrum. A few swallows of water may aid the passage through the œsophagus. When it is estimated that the tip is about four inches short of the pylorus, the tube is temporarily fixed in this position. The most important part of the manœuvre must now be performed, that is, the passage of the tip through the pylorus. To achieve this, the stomach is aspirated by continuous suction for some four hours. The patient should lie on his right side. The tube is pushed on one inch every half-hour for six hours. It is hoped that by approaching the pylorus slowly in this way the tip will be carried directly into the duodenum. If rapid introduction is allowed, the tube coils up in the stomach. The main object of the instrument is thus defeated, and in addition there is danger that the tube may knot itself in the stomach. The only certain method of recognizing that the tube has entered the duodenum is by X-ray examination. If coiling in the stomach has occurred, the tube must be withdrawn to its original position and the process of slow introduction recommenced. Miller and Abbott have suggested that, instead of the patient lying on his right side, he should lie on the left, that the stomach should be moderately filled with fluid, and the balloon inflated and so floated up and through the pylorus. In any case, as soon as the balloon enters the duodenum, it should be inflated and continuous suction continued. It may then be expected that the tube will pass on at the rate of about one to two feet every hour. A length of six inches is fed in every half-hour or so until the whole length is passed in, or until X-ray check shows that the tip has reached the site of obstruction or the ileo-caecal valve. Blockage of the suction tube should be avoided by hourly irrigation with a little tap-water. When the tube has passed the pylorus, clear fluids by mouth are allowed, and later soft solids. Instillation of nasal drops is necessary to prevent crusting of the nasal mucosa. Tubes have been retained for fifteen days with this routine. During the treatment it is most essential that accurate records of fluid balance should be kept, showing intake by mouth or parenteral routes and output by suction, micturition *et cetera*. A satisfactory urinary output is the simplest check on fluid balance. When gas and fæces are again passed *per rectum* the suction is discontinued, and if fluid and food can then be taken by mouth and retained, the tube may be withdrawn. The balloon is deflated and a foot or two withdrawn every hour.

Carcinoma of the Œsophagus.

J. H. GARLOCK (*The American Journal of Surgery*, October, 1941) states that until recently a diagnosis of carcinoma of the œsophagus carried with it a fatal prognosis. Deep X-ray treatment was then given, at times after gastrostomy. With this as the routine treatment, a tremendous amount of experience has accumulated, and the results may be assessed. It is claimed that only twenty patients may be regarded as having been cured under this régime. Some of these cases do not stand critical review, as confirmatory biopsies were not performed, and follow-up periods were too short. In view of this position, a revival of interest has taken place in the surgical treatment of the disease. Dysphagia is the cardinal symptom. But in some cases of the excavating type dysphagia may not appear till the disease is well advanced. The length of the history is therefore not a sure criterion of the extent of the disease and of its operability. Neither are the rate and degree of loss of weight very helpful in this respect. They, too, depend on whether the growth tends to impinge on the lumen or to be more of an ulcerating excavating type. The site of the lesion may be some guide as to operability. Growths in the middle third tend early to become inoperable by fixation to aorta or left bronchus. Those above the arch of the aorta tend to undergo metastasis early to the supraclavicular glands or to involve the recurrent laryngeal nerve. In the case of growths at the lower end, squamous carcinoma appears to spread mainly to the regional mediastinal glands. But in cases of adeno-carcinoma in this position, indicating an origin from mucosa of the cardia or upper portion of the stomach, the spread is predominantly subdiaphragmatic. Persistent backache is often a sign of inoperability, as it may indicate extension to the aorta or vertebræ, or in the case of adeno-carcinoma of the lower end, to the pancreatic region. The presence of an involved supraclavicular gland proved by biopsy is an indication of inoperability. Any patient complaining of dysphagia should be submitted to careful X-ray examination of the œsophagus and stomach. If this reveals no abnormality and symptoms persist in spite of symptomatic treatment, the examination should be repeated after three or four weeks. Any suspicion of growth should then lead to œsophagoscopy and biopsy examination. If the growth proves to be adeno-carcinoma, a preliminary abdominal exploration should be performed to determine whether subdiaphragmatic spread has already rendered resection futile. Pre-operative treatment is important to reestablish fluid, protein, vitamin and salt balance. The mouth should receive attention. Cleansing of the growth may be assisted by chemotherapy and irrigations with saline solution. Most patients can be got into good condition without gastrostomy. Should alimentary feeding be necessary, a jejunostomy through a low incision is preferred. For anæsthesia, "Avertin" with cyclopropane or ethylene is used. Complete collapse of the lung must be prevented, and a competent anæsthetist is essential. The author avoids intratracheal methods of anæsthesia. For growths at the lower end a transthoracic, transdiaphragmatic resection is performed with anastomosis of the œsophagus to the upper anterior stomach wall. For growths in the middle third a modified Torek operation is performed. Blood transfusion is given before, during and after operation. A series of 54 cases is presented. Of these, 28 were considered operable, and resection was performed. Details are given of each case, with operative and subsequent mortality, and the duration of survival to date of the ten surviving patients, amounting to five years, two and a half years, two years and lesser periods. The chances of survival are estimated. Results will no doubt improve with further knowledge and experience.

British Medical Association News.

SCIENTIFIC.

A MEETING of the Victorian Branch of the British Medical Association was held on November 12, 1941, at the Medical Society Hall, East Melbourne, DR. H. BOYD GRAHAM, D.S.O., M.C., the Acting President, in the chair.

Bladder Neck Obstruction.

DR. HENRY MORTENSEN read a paper entitled "The Problem of Bladder Neck Obstruction" (see page 275).

DR. LEO DOYLE said that he agreed in most respects with Dr. Mortensen's presentation of the subject, upon which he congratulated him; he had given them practically a complete description of the disease. Most general hospital surgeons hated to deal with patients with prostatic troubles; the patients were old and ill and had usually been subjected to catheterization before admission to hospital. Retention of urine was a serious disease, but if it was overcome at the time there was a tendency to consider that the patient had recovered. If it was treated as a serious emergency and an indication of further trouble to come, the first catheter passed would be the one that was tied in; it was the easiest one to pass, and the patient would be given relief and soon would be likely to be fit for what further treatment was indicated. Dr. Doyle went on to say that he was surprised to note how many patients, even after their admission to hospital, died before prostatectomy was undertaken. With careful asepsis fewer of them would die; retention of urine was not regarded sufficiently seriously. Though he realized that carcinoma of the prostate was not a hopeful question to discuss on account of the seriousness of the prognosis, Dr. Doyle drew attention to the importance of attempting early removal after diverting the urinary stream on the evidence obtainable by careful examination of a biopsy specimen. In the treatment of simple hypertrophy of the prostate, Dr. Doyle considered that resection was the ideal procedure; it was a difficult operation to learn, however, and if a surgeon was not skilled at it he should learn slowly from someone who could teach him. He did not agree with what Dr. Mortensen had said about the securing of hæmostasis by suturing in suprapubic prostatectomy, as he preferred to use Pilcher's bag. He was in the habit of leaving the bag in for an hour with the pressure applied, and after the manner of a tourniquet, to reapply pressure if and when bleeding started. He also liked to put in a tube for drainage. He added that the patients were old and suturing increased the operating time and the amount of manipulation. Finally, Dr. Doyle said that it was desirable that proficiency and operative dexterity should be acquired by operating on small prostates; the larger and more difficult ones should be reserved for the most experienced urological surgeons.

DR. C. B. MELVILLE expressed his appreciation of Dr. Mortensen's paper. He said that he thought it was obvious that transurethral resection of various types of bladder neck obstruction was accepted as an established and valuable procedure. Visualization of the bladder neck was an important preparatory step, and as Dr. Mortensen had said, the ordinary cystoscope did not reveal nearly enough of the bladder. Some form of urethroscope was essential, and Dr. Melville believed that the best type to use was a direct vision resectoscope without a lens system with a direct vision urethroscope. Conversely, if the McCarthy lens type resectoscope was used, a urethroscope for oblique vision was to be preferred. Dr. Melville himself used the Thompson direct vision cold punch resectoscope; but he had no great quarrel with those who preferred to use a high-frequency activated loop as the cutting agent. He thought, however, that no one man could become expert in the use of both types, and each should choose one type and stick to it. He remarked in passing that in the early days of resection at the Mayo Clinic, all forms of resectoscope were tried and the cold punch method had come to be the only one employed; it had proved its worth, and nowadays all prostatic obstructions were dealt with there by that method.

Dr. Melville agreed with Dr. Mortensen's statement that transurethral resection was indicated in obstruction caused by carcinoma of the prostate, contracted bladder neck and moderately sized hyperplastic glands. Dr. Melville also agreed with what Dr. Mortensen had said concerning the difficulty in removing enough tissue within a reasonable time when the prostate was really large. That difficulty made him prefer enucleation for the large prostate, though he believed that eventually, as he developed skill and speed, he would resect even the large glands. He commented that it was a stimulating experience to watch such men as Thompson and Emmett remove over 100 grammes of tissue in approximately forty-five minutes; that amount of tissue formed a mass the size of a tennis ball, and their claim to be able to perform complete prostatectomy by the resection method was obviously well founded.

Dr. Melville then discussed the amount of tissue it was desirable to remove by resection in prostatic hyperplasia. He said that to give a perfect result all intravesical tissue and as much of the intraurethral lobes as possible should be removed, a cone-shaped cavity leading from the verumontanum straight into the bladder being left; the cut should not go distal to the verumontanum, which for practical purposes marked the beginning of the external sphincter. Dr. Melville then spoke on renal function tests as applied to patients regarded as "poor risks" if submitted to operation. He remarked that he had been impressed at the Mayo Clinic with the reliance placed on the concentration of urea in the blood as a test of renal function. Occasionally he had seen creatinin estimations asked for, and sometimes the carbon dioxide combining power of the plasma was estimated; but tests that were practically never used included the phenolsulphonephthalein test, the urea clearance test and the indigo-carmine test. The reason for that state of affairs was, he believed, that the retention of metabolites, such as urea, in the blood depended not only on the amount of renal tissue capable of functioning, but also on certain extrarenal factors, such as dehydration, low blood pressure and a diet rich in protein. If those extrarenal factors were controlled, the blood urea estimation remained the most valuable single test of renal function. In addition, Dr. Melville mentioned that the type of renal damage sustained in prostatic obstruction was that due to a combination of back pressure and infection; "surgical" nephritis, as opposed to "medical" nephritis, was usually a reversible process. Dehydration was the most striking extrarenal factor influencing the concentration of urea in the blood; if the dehydration was overcome by free administration of fluids, preferably by the intravenous route, and the "surgical" nephritis process was reversed by appropriate drainage, it was truly amazing to note how rapidly and how frequently the blood urea reading fell practically to the normal figure. A large proportion of the incipient uræmics with prostatic obstruction were suffering not from excessive renal damage, but from dehydration. Dr. Melville said that if a patient otherwise in good condition was secreting enough urine (3,000 cubic centimetres daily) to wash away metabolites and the blood urea level was falling, Thompson considered that he was a fit subject for transurethral resection, even though the blood urea level at that time was approximately 100 milligrammes *per centum*; if Thompson was in doubt, a blood creatinin estimation would be made.

Dr. Melville then said that in choosing the time to operate he was guided by the principles he had enunciated, though he preferred to wait for more stabilization of the patient's condition. If the blood urea estimation was satisfactory, the patient was secreting urine freely and there were no other contraindications, he would perform and had performed suprapubic enucleation or prostatic resection even when the urea clearance test result was poor. Finally, Dr. Melville referred briefly to the carbon dioxide combining power of the plasma and to anuria in the treatment of patients offering a poor surgical risk. With reference to the former, he said that the injured kidney might not manufacture normal amounts of ammonia, and in that event the acid-base balance was disturbed, with the production of acidosis; a low figure, therefore, should be treated as a guide in the intravenous administration of sodium bicarbonate (5% solution), which rapidly and effectively raised the figure. That treatment should not be overdone, however, and the effect should be checked by repeated estimations of carbon dioxide in order to avoid the production of alkalosis. Speaking of anuria, Dr. Melville remarked that a severe fall of blood pressure was a potent cause of damage to a kidney and might render the "surgical" nephritic process irreversible. The blood pressure should be checked frequently during the operation, as shock, hæmorrhage or even the administration of the anæsthetic might make it fall, and steps to raise it should be taken immediately it fell below a certain figure. The treatment used included ephedrine, glucose and saline solution given intravenously, transfusion of blood, and last, but not least, a 5% solution of gum acacia. If anuria threatened after operation, in addition to the forcing of the fluid intake, a small transfusion of blood usually acted as a charm.

DR. W. OSTERMEYER thanked the urologists for the informative material presented, which would serve to keep members up to date. The new method of cystourethrography described in Dr. Mortensen's paper appealed to him as an ideal diagnostic procedure. It had occurred to him that a patient with residual urine might be able to obtain relief

by an alteration of the posture of his body; in the circumstances it was improbable that he would be able to pass urine while lying on his back in bed.

DR. MORRIS C. DAVIS commented on Dr. Melville's statement that reliance could be placed on the blood urea level alone in the estimation of a patient's suitability for prostatic surgical measures; that test might be misleading as an indicator of renal activity. In a recent series of cases the blood urea level had frequently been found to be normal, though renal dysfunction had been proved by other tests to exist. The urea clearance test was probably the most reliable of the satisfactory modes of assessment of renal function, as it took into account the relationship between the level of blood urea and the concentrating power of the kidney. Frequently the blood urea level would be normal, though the clearance test revealed renal impairment. While the urea clearance test would not replace the information to be obtained only by a combination of the results of clinical examination with it, Dr. Davis was of the opinion that no kidney investigation was complete without it. To place sole reliance on the blood urea level would frequently result in serious errors in the estimation of a patient's fitness for operation.

DR. JOHN KENNEDY also thanked the opening speakers for the excellence of their contributions. As he had seen it performed he was able to confirm the statement that at the Mayo Clinic, by means of the resectoscope, as much as 125 grammes of prostatic tissue could be removed in less than an hour. He asked Dr. Mortensen whether he controlled hæmorrhage by suture after a suprapubic operation, whether he used that procedure always, the urine being quite clear, and whether he had to encounter post-operative difficulties. It had been stated that Pilcher's bag might be left in for a day or two; Dr. Kennedy had used it regularly for fifteen years and had not encountered incontinence of urine lasting for more than a few weeks. He still thought the method simple and practical, but was careful to put the bag in when there were no clots in the cavity.

Dr. Kennedy then said that the preparation of patients by the indwelling catheter had been mentioned; but he had noticed no reference to suprapubic puncture. This procedure had been adopted at the Alfred Hospital in preference to the use of the catheter, which predisposed to sepsis. Dr. Kennedy asked Dr. Mortensen to express an opinion about suprapubic puncture. He also wondered whether Dr. Mortensen injected paraffin through it instead of lubricating the catheter.

DR. G. R. DAVIDSON discussed the desirability of estimating cardio-vascular efficiency. He said that patients died of peripheral circulatory failure. He also wondered what was regarded as the ideal anæsthetic for prostatic surgery; he was in the habit of using spinal anæsthesia.

Dr. Mortensen, in reply, said that he agreed with Dr. Doyle that if carcinoma was diagnosed at an early stage some surgical attack should be attempted; but he did not think it satisfactory to rely on diagnosing carcinoma of the prostate from biopsy material obtained through a resectoscope; carcinomata detectable by rectal examination might be missed altogether. He knew that Dr. Doyle favoured the use of Pilcher's bag, and that he could use it ideally; but the danger was that if tension was left for as long as twelve hours the patient might be left with permanent incontinence of urine. Dr. Mortensen then said that he agreed with Dr. Melville that it was the ideal to be adept at at least one method. As Dr. Davidson had said, a fall of blood pressure was of great importance; the introduction by the intravenous route of "Neo-Synephrin" in glucose and saline solution was of great value. Dr. Mortensen reminded Dr. Ostermeyer that under a seal of fluid by drainage through a catheter left *in situ* the urine was siphoned off irrespective of the posture of the body. In reply to Dr. Davis, Dr. Mortensen said that actually there was no perfect test of kidney function. It was a fact that patients unexpectedly died of uræmia at times. A clinical appreciation of the state of the patient was very valuable; he would not operate when the patient's tongue was dirty; a clean tongue and a clear complexion were important clinical signs. Dr. Mortensen would operate when the clinical condition was satisfactory, if the excretory system was stabilized, though not proved to be in good functional order. He informed Dr. Kennedy that he did not like suprapubic puncture; there was a danger of injury to the peritoneum and splitting of the bladder wall leading to extravasation when the puncture was not too low for effective drainage. He added that he punctured the bladder when it was exposed at operation, after releasing the peritoneum. He thought that lubrication of the urethra with a good tube lubricant achieved the same objective as paraffin, which was inferior as a lubricant. Dr. Mortensen informed Dr. Davidson that he was of the opinion that as yet no ideal anæsthesia for prostatic surgery had been introduced. Inhalation anæsthesia was disadvantageous for aged patients, and spinal anæsthesia was pleasant for the surgeon; but the risk to the patient of a fall in blood pressure and the necessity to stand the patient on the head almost for hours after the operation were real risks; besides, blood was apt to collect in a pool in the bladder in the early post-operative stage. Dr. Mortensen still used spinal anæsthesia, but though he was not experienced in its use, he had become interested in the possibilities of the value of "Pentothal Sodium" in saline solution given by the intravenous route.

MEDICO-POLITICAL.

A MEETING of the Eastern Suburbs Subdivision of the Victorian Branch of the British Medical Association was held at Saint George's Hospital, Kew, on September 11, 1941, DR. G. WINTER ASHTON in the chair.

Possible Impending Changes in Medical Practice.

The meeting had been called to discuss possible impending changes in medical practice. Dr. Ashton opened the discussion. He said that it seemed to be a suitable time to draw members' attention to the fact that there were many influences at work tending to bring about important changes in the sphere of medical practice.

Members knew there were many people, both inside and outside the profession, who believed that considerable improvements in the medical care of the populace would result if rather radical alterations were made in the present scheme of things, and it had been part of the Branch Council's duties in the last year to consider and discuss these proposals.

Briefly the practical possibilities were two: (*a*) some modification of the comatose national health insurance scheme of the Federal Government, (*b*) some scheme based on a salaried medical service.

Social conditions were in a state of flux, and might change more rapidly in the near future, and it seemed that members should be warned of what was going on, so that they could think for themselves about the possibilities and the advantages or disadvantages of any proposal.

Dr. Ashton said he did not wish to discuss in any detail national insurance, except to say that as far as was known there was still a body of political opinion in favour of it, and the act had never been recalled but only shelved, so that he thought that he was correct in saying that it could be made law at very short notice.

The Federal Council had under discussion at present a scheme of its own for a "General Medical Service for Australia", drawn up by Dr. Bell and Dr. Simmons, both of Sydney, and known as the "Bell-Simmons" report. Briefly it was a health insurance scheme based on a capitation fee, and though in many respects better than the national health insurance scheme of the Government, it did not do away with many disadvantages; for example, there was no provision for limiting the hours of doctor's work or the number of visits *et cetera*.

This scheme had been considered by the Victorian Branch Council at a special meeting, and the conclusion reached was that although the Bell-Simmons scheme embodied all the principles for an insurance scheme laid down in the Federal Council's policy, the Victorian Branch Council was not prepared to give it whole-hearted support till a scheme based on a salaried medical service had been considered also.

There was thus a body of opinion in the Branch Council somewhat in favour of a salaried medical service, and it appeared that members might in the near future have to decide which of these two types of service they would consider preferable.

The Branch Council had appointed a subcommittee which had prepared a scheme for a general medical service based on salaried medical officers; but this scheme could not become the policy of the Branch without its approval by convocation.

The general advantages and disadvantages of a salaried medical service were well known. There were, however, one or two practical points that ought to be worth earnest consideration. From the medical practitioner's point of view such a scheme had advantages.

For the purpose of the discussion the profession could be divided into three age groups: (i) those approaching the retiring age, (ii) those in active general practice, (iii) those commencing or about to commence practice — medical students and resident medical officers.

Dr. Ashton thought that the three groups might react differently to any particular scheme. It was more than likely that points which appeared to group (ii) to be dis-

advantages might appear exactly the opposite to members of other groups, particularly group (iii).

The natural reaction of any member of group (ii) when confronted with a definite scheme would be: "How will this affect me?" "Will I be better off or less well off?" "Will the proposed advantages as regards more regular working hours and holidays, opportunity for post-graduate study *et cetera*, adequately compensate for loss in income?" "Will I receive any compensation for what I have spent years in building up, that is, the goodwill of my practice?"

Dr. Ashton said that these were very important practical considerations, and members should have formulated in their minds very definite ideas as to: (*a*) the scale of salaries to be paid, (*b*) amount of time off and holidays, (*c*) compensation for goodwill, and be prepared to be very insistent on them.

The control of such a scheme was also of great importance, for the smoothness of working would be directly proportional to the degree of direct medical representation on the controlling body.

The Victorian Branch Council was fully aware of the importance of these points, but as they might affect members so very personally, Dr. Ashton stressed the wisdom of giving them personal consideration.

In conclusion, Dr. Ashton drew attention to the recent report of the National Health and Medical Research Council which appeared in THE MEDICAL JOURNAL OF AUSTRALIA of a recent date. This report dwelt at some length on the desirability of some change in the conditions of medical practice, then went on to offer some well-merited criticism of the Federal Government's national health insurance scheme, and finally considered briefly the possibility of introducing a scheme based on salaried medical officers. Although it did not say so definitely, the impression of anyone reading it would be that the National Health and Medical Research Council was in favour of such a scheme, at any rate to a great extent; and the importance to practitioners of this was that the National Health and Medical Research Council was a child of the Federal Government, which was likely to look with a fatherly eye on its outpourings.

Dr. Ashton suggested that in any political discussion the report of the National Health and Medical Research Council would carry far more weight than any report of the Federal Council, and for this reason members should be wise to regard this as something showing which way the wind was blowing.

The Chairman then invited expression of opinion on (i) the general reaction of members to such a scheme; (ii) particular reactions to such things as salaries, time off, control and compensation.

Such discussion would be of great help to the Eastern Suburban Council representative in any further deliberations which might take place.

DR. H. C. COLVILLE said that in his official capacity as a member of the Federal Council he was greatly concerned about the matter before the meeting. The established policy of the Branch Council was a *per capita* system of payment in any national health insurance scheme. A salaried service would, however, be carefully considered by the Council, but abandonment of the present method of private practice would cause regret, and any national service in which a third party intervened between doctor and patient could never adequately take the place of the present one.

DR. W. L. CARRINGTON expressed gratitude to the leaders of the profession for the time and care given to the question. He considered team work to be essential in modern medical practice. Individual medical practice was inefficient, and every suburb should have a medical centre consisting of a hospital and a team of medical practitioners to do the work of the out-patient department. This should be a salaried service and all work beyond the capacity of the suburban clinic should be passed on to a base hospital. Dr. Carrington's main contention was that to acquire the best team work the individuals should receive salaries and not remuneration on a *per capita* basis. The medical officers should be paid so much per session and then could work for just as many sessions as they pleased. Thus class (iii) of Dr. Ashton's classification could work within their capacity and classes (i) and (ii) could, if they wished, work for the maximum number of sessions permissible. Regarding the question of goodwill, he thought that there should be compensation by the Government at the inception of any national health service. He considered that medical men at present in the overseas forces should be consulted before the profession in Australia came to any decision.

DR. E. M. INGLIS considered the report of the National Health and Medical Research Council a good one. It stressed the present conditions of medical practitioners: working seven days of twenty-four hours. He considered salaries with good conditions a sound idea.

At this stage the Chairman, in answer to questions, said that a salaried medical officer would be expected to do all that a general practitioner now did, and that an income limit for insured persons would probably be imposed and that ordinary present general practice would survive to some extent.

DR. ESSER said two problems were: how to limit the number of patients, and how to limit visits to the surgery by people seeking medical aid for trivial complaints. In Germany patients had to buy a form to present to a doctor, and this to some degree prevented people worrying the medical officer about trifling matters. He wished to know who would control any health scheme and how much was the doctor to be paid. The doctor must be enabled to maintain a decent standard of living. He thought that £800 to £1,000 a year net would possibly be fair remuneration. (Other members suggested that a reasonable income would be £1,000 *per annum* at present currency rates, as the present average gross income of medical practitioners was about £1,500.) Dr. Esser's opinion was that there should be an income limit; that the medical practitioner should get two-thirds of the specified salary and that this should be supplemented by a small visitation fee so as to give an incentive to the better class of practitioner. He also considered that the salaried officer should not be allowed to do any private practice, but that this should be limited to men doing private practice only.

DR. RALPH ALLEN favoured suburban clinics at hospitals. He considered that private practice should be entirely eliminated with its refined torture of subjection to bells ringing. The economic factor in relation to the patient should be abolished; the service should be free to all. Such a service would enable the medical practitioners to discipline patients, instead of being subservient to them. There should be highly trained district nurses who would act as buffers between the doctors and an untrained, undisciplined and covetous public. This would cut out a great deal of unnecessary work. Dr. Allen enlarged on the pleasure of a practice of this kind, untrammelled by the necessity to truckle to patients so as to get custom. He certainly favoured a salary for medical officers.

DR. L. KIRSNER said he did not favour any feature of a salaried scheme except the central clinics.

DR. R. SICREE emphatically protested against government control of any scheme. A cheap service would be the objective of any government, and medical men would be forced to form themselves into a trade union. The profession must control any scheme if it were to be efficient.

DR. ARTHUR LANGLEY did not favour the public having a free choice of doctor in general practice. It was merely a survival of an outmoded and unnecessary custom. He favoured a salaried service with a superannuation scheme. Opportunity for advancement should be given, and each district should be efficiently manned to do all work, thus allowing for local grading of medical officers. He considered the service should be free to all members of the community. The private general practitioner would survive just as the church, public and associated schools survived the introduction of free education.

DR. H. C. COLVILLE stressed the two views expressed at the meeting, namely, that there should be either an income limit scheme or a free-for-all scheme. The Government would, he thought, favour a community scheme—a free-for-all scheme. He again read an extract from the report of the National Health and Medical Research Council: "Care of personal health is a social duty and not that of the individual."

Finally Dr. Carrington moved and Dr. Roy Watson seconded the following motion, which was carried:

> That this subdivision urges the profession in Australia to try to formulate an agreed plan for a national medical service.

To further this motion it was decided to submit the minutes of the meeting for publication in THE MEDICAL JOURNAL OF AUSTRALIA.

A further meeting of the Eastern Suburban Subdivision of the Victorian Branch of the British Medical Association was held at Saint George's Hospital, Kew, on December 11, 1941. Dr. Ashton was in the chair. There were fifty members present.

Dr. Ashton's address at the meeting of September 11, 1941, and condensed remarks of speakers at this meeting were read by the Honorary Secretary.

The Chairman then threw the meeting open for discussion, the ten resolutions carried at a meeting of the north London practitioners on September 2, 1941, having been declared the agenda.

Resolution 1.—A State medical service must take into adequate consideration the just requirements of the general practitioners of the country.

The meeting decided that this be taken as read.

Resolution 2.—Adequate compensation should be made to existing practices.

The meeting was unable to determine what was adequate compensation. The following suggestions were made: (*a*) average one year's takings over past five years, (*b*) two-thirds of this, (*c*) one year's average less one year's salary, (*d*) the pension or superannuation be reckoned as adequate compensation.

Resolution 3.—Salaries rather than capitation fees are desired—salaries to be based on years of service and experience.

Discussion on this resolution was directed mainly to whether patients should or should not have free choice of doctors in a salaried service, the latter of which seemed to appeal to most speakers.

DR. PETERS and DR. FORSHAW, who had both practised under salaried service schemes, said that a system of no free choice of doctors worked well.

DR. HOGGARTH said that medical officers should try to eliminate free choice of doctors. "Medical officers should not give way to the foibles of ignorant and stupid appraisement of medical work."

DR. CARRINGTON, DR. WANLISS and DR. CAMPBELL thought there should be free choice of doctors and that doctors should have free choice of patients.

DR. GRIFFITHS (Egypt) said that in Egypt there were both salaried and private practices and this did not work well. In a salaried service doctors were very careful in their work because of supervision by superior officers, but on the other hand, they were sometimes afraid to do enough.

DR. F. M. READ asked what rights of transfer and sale of practices salaried medical officers would have.

THE CHAIRMAN: None.

Three of the younger members, DR. WATTERS, DR. SMITHERS and DR. KIRSNER, were definitely in favour of a capitation fee scheme.

DR. ROY WATSON (representative to the Council) said that a large element of compulsion would be in any scheme. The Government would force their own scheme on the profession and the public. The general implications must be studied and not the choice of a scheme. The profession must try to steer the Government's chosen scheme into a course which would not be too hard on the general practitioner.

DR. BARTRAM, after stressing the real advantages of a salaried scheme—fixed hours, pensions or superannuation, holidays and sick leave with pay, and opportunities for post-graduate study, moved that:

> Should a salaried service be instituted, the salaries should be adequate and reasonably related to present earnings of general practitioners, and that appointments to the higher salaried posts should be based on: (*a*) years of experience, (*b*) professional experience, (*c*) professional skill.

This was seconded by Dr. MacKay and carried.

Resolution 4.—Pensions to be granted on retirement.

This was amended by the addition of the words: "and provision be made for dependants if death occurs before retirement or disablement", and carried as a motion.

Resolution 5.—Daily hours of attendance to be limited and time off duty to be given each week. Annual leave granted on pay.

This was amended by the latter phrase being added, thus: "Annual leave and sick leave to be granted on pay."

Resolution 6.—Refresher courses should be provided periodically on pay.

This was carried.

Resolution 7.—Opportunities should be granted to general practitioners for means of obtaining specialized experience and [for] research.

This was carried.

Resolution 8.—The general practitioner should have access to hospitals.

Resolution 9.—Clinics should be established as the centre for general practice.

Resolutions 8 and 9 were combined into the following motion, which was carried:

> District clinics should be established at hospitals to which the general practitioners should have access for the treatment of their patients.

Resolution 10.—Furthermore, it is resolved that for the success of a State medical service the general practitioner should have fair representation upon any planning board for the institution of such a service and in its subsequent administration.

This was carried.

It was further resolved by the meeting:

> That some provision be made for travelling expenses for domiciliary attendance.

Medical Societies.

THE UNIVERSITY OF SYDNEY MEDICAL SOCIETY.

AN appeal is being made to graduates in medicine of the University of Sydney to join the University of Sydney Medical Society, and by so doing to create and foster the medical society spirit among students. Subscription of one guinea entitles graduates to all publications of the society for four years. Cheques should be made payable to the Honorary Treasurer. The Honorary Secretary, Mr. J. M. L'Estrange, at the New Medical School, will be happy to give to graduates any further information.

Medical Practice.

THE CONTROL OF RADIUM.

THE following National Security (Radium Control) Regulations were notified in the *Commonwealth of Australia Gazette* of February 11, 1942.

1. These Regulations may be cited as National Security (Radium Control) Regulations.

2. These Regulations shall be administered by the Minister of State for Health.

3. In these Regulations, unless the contrary intention appears—

> "authorized person" means a person authorized by the Minister or by the Director-General to act as such for the purposes of these Regulations;
> "radium" means radium and radium salts used in the treatment of disease;
> "the Director-General" means the Director-General of Health.

4. Every person who owns any radium shall, within fourteen days after the commencement of these Regulations, furnish to the Director-General (in triplicate) a statement setting forth—

> (*a*) his name and address;
> (*b*) the quantity of radium owned by him;
> (*c*) the name and address of the person in whose possession the radium is;
> (*d*) the numbers of each type of container (whether needles, tubes, plates or other type of container) in which the radium is contained;
> (*e*) the nature of the material of which the containers are made (whether metal, glass or other material); and
> (*f*) the quantity of radium in each type of container.

5. (1) The authority responsible for the administration of a hospital which owns, or has on the hospital premises, any radium shall, within twenty-eight days after the commencement of these Regulations, provide a number of steel containers sufficient to contain all the radium on the hospital premises.

(2) Every person (other than an authority responsible for the administration of a hospital) who has radium in his possession shall, within twenty-eight days after the commencement of these Regulations, provide a number of steel containers sufficient to contain all the radium in his possession, or shall make arrangements approved by an authorized person for the disposal of that radium in other steel containers.

(3) The containers—

> (*a*) shall have a central cavity the walls of which shall be at least three inches thick; and
> (*b*) shall be of a type approved by the Director-General or an authorized person.

(4) The authority responsible for the administration of a hospital shall cause all radium on the hospital premises, when not actually in use, to be stored in radium containers provided under this regulation and shall place the containers in a basement or safe place within the hospital premises approved by an authorized person.

6. (1) Every person having radium in his possession shall, on receipt of a notice to that effect signed by an authorized person, deliver all the radium in his possession, or such radium as is specified in the notice, to a place so specified and at a time so specified.

(2) The person having the radium in his possession shall—

(a) seal the container in which the radium is placed and write his name and address thereon or on a label affixed to the container; and

(b) so dispose or protect the radium that it will be harmless during transportation.

7. (1) An authorized person may give notice in writing to any person having radium in his possession specifying a place to which the radium shall be delivered on receipt of warning of an impending enemy attack, whether by air or otherwise.

(2) On receipt of warning of such an attack—

(a) the authority responsible for the adminsitration of a hospital shall cause all radium in use to be stored in containers provided under regulation 5 of these Regulations; and

(b) every person having radium in his possession to whom a notice has been given under sub-regulation (1) of this regulation shall forthwith deliver all radium in his possession to the place specified in the notice.

(3) The provisions of sub-regulation (2) of the last preceding regulation shall apply with respect to radium to be so delivered.

8. In the event of enemy action causing damage to premises on which there is any radium, and dispersal of the radium is known or suspected, the occupier of the premises shall forthwith notify the Director-General, and the nearest authorized person known to the occupier, by the fastest available means of communication.

9. Neither the Commonwealth nor an authorized person shall be liable in respect of any loss of or damage to radium which is being transported or stored in pursuance of these Regulations.

Correspondence.

SOCIAL SECURITY.

SIR: I wish to sincerely congratulate you upon the leading article on "Social Security" of December 20.

This is one of the finest leaders that has graced the columns of the journal under your editorship.

Whilst disagreeing with some of the minor points you have mentioned, such as Saint Paul was a socialist because he wrote, "That if a man did not work, neither should he eat". Such a statement stamps him as a realist, not a socialist, who is a dreamer.

I find myself in agreement with the main tenor of your argument, and it is summed up in your phrase: "Each man and woman must indeed remain the master of his fate and bear the consequences of his act and of his omissions." This is indeed the motive force of all evolution. It is natural law, and when we attempt to circumvent Nature, however laudable our intentions, results which are ultimately disastrous ensue.

Social security cannot be secured by legislative enactment, unless such enactment is in accordance with natural law, which, being translated into socio-economic terms, means "justice".

We cannot make society a heaven for all or for any. Men are born unequal. The only equality they should have, and at present this is denied, is equality of opportunity, the fundamental basis of which is their relationship to land, from which all wealth is derived.

It is impossible and unnecessary to divide land up among all, but the economic rent of land could and should be taken for the benefit of all by legislative enactment. The basis of equality of opportunity would then be founded.

Only by this means can men be free from the social injustice which is now in a fair way to destroy them. No one can deny this fact, but most evade it, either from unworthy motives or because they are not capable of logical reasoning.

Further, your article, January 31, 1942, is to be highly commended. It is a wonderful instance of the change that is taking place in our profession, when articles such as this appear in our journal, from the pen of the Editor.

You rightly state that democratic society is one in which there is no privilege. Now the first great privilege granted or stolen is the private ownership of land. From this fundamental wrong have arisen numerous other privileges, such as tariffs *et cetera*. It is privilege that has destroyed democracy.

But you err when you go on to state that wealth inherited or acquired is a privilege. In many cases now and in all cases under a condition of society where no privileges existed, wealth would represent the true reward of labour and abstinence; to declare all wealth as a privilege is manifestly unjust. To do so would be to destroy the accumulation of wealth and lead to poverty.

This is one of the fallacies and pitfalls of socialist thought, which seeks to level the reward of labour. This was attempted in Russia and of course failed.

But your statement that democracy cannot fully function where privilege exists stands as a beacon light that alone can prevent the "Ship of State" from becoming wrecked.

It is to be hoped all your readers will ponder over it.

Yours, etc.,

PAUL G. DANE.

110, Collins Street,
Melbourne,
February 16, 1942.

THE COMMON COLD.

SIR: I cannot allow to pass the statement in your leader in THE MEDICAL JOURNAL OF AUSTRALIA of the 14th instant that: "It is probably true . . . that a cold untreated lasts for two weeks and that when it is treated it lasts for a fortnight." Lest members of the medical profession should likewise be ill informed, I am obliged to state that the common head cold can be aborted and can be cured. I have been using a short-wave machine with a mechanism attached which is the invention of Dr. J. P. P. Stock, an English doctor, in collaboration with Dr. C. R. Burch, who, I understand, is one of the leading physicists in the world. One application of ten minutes will abort a head cold of twenty-four hours' duration; two applications will cure a cold of two or three days' duration, and a larger number of applications according to the duration and progress of the condition. Where the cold has resolved itself into chronic sinus infection, as many as ten applications may be necessary. Cases over twelve months old are more difficult to treat and less responsive to treatment.

Any ear, nose and throat surgeon or practitioner is at liberty to inspect the machine, and I hope later to give a more detailed description.

Yours, etc.,

WILKIE SMITH.

Sydney,
February 17, 1942.

Obituary.

GEORGE ERNEST CLEMONS.

WE are indebted to Dr. G. H. Hogg, of Launceston, for the following appreciation of the late Dr. George Ernest Clemons.

The death of my old friend of sixty years awakens many memories of him as a school mate at the Grammar School, as a fellow student at Edinburgh, and as a colleague.

After graduating in 1891 he held resident appointments at Nottingham and at the Liverpool Infirmary for Children. At Liverpool he earned the reputation of being one of the most efficient residents whom the hospital had possessed. Of these, one became the leading consultant on diseases of children in Liverpool, while the second became senior physician to the Royal Infirmary of Edinburgh.

Dr. Clemons had the good fortune during his medical course to work for some time in the clinics of McGill and Mayo Robson at Leeds, and he often talked to me of these two men, with whose work in those days I too was acquainted.

Returning to Edinburgh, he took his M.D. degree and his surgical Fellowship, specializing in anatomy for this examination.

An expert anatomist, possessing a wide knowledge of pathology and thoroughly imbued with the surgical teachings of Edinburgh, Leeds and Liverpool, he was the first to introduce modern ideas of surgery into Tasmania. As an operator there was nothing theatrical about his work, but with his accurate knowledge of anatomy and pathology and his vast clinical experience he was recognized as most careful and thorough in his methods, and above all as a man whose sole consideration was the welfare of his patient. During his prime he was undoubtedly the ablest surgeon in Tasmania. As he became older, he handed over his operative work to his son Dr. Max Clemons.

At the beginning of this century Dr. Clemons, along with the late Dr. Wilson and the writer, horrified as they were by the lack of accommodation for women and the absence of trained midwives in Tasmania, which resulted in a high mortality rate, succeeded in the face of great opposition in founding the Queen Victoria Hospital with a training school for maternity nurses.

Some time ago, pointing to the beautiful Queen Victoria Hospital, which now stands as an ornament to the city, he spoke to me with deep feeling of those early struggles which he believed had been the means of saving the lives of thousands of women and children.

He was one of the small group of medical men in Hobart and Launceston who played an active part in the effort to place a proper public health act on the statute book, the first clause of which stated that the chief health officer of Tasmania must be a properly qualified medical man possessing a degree or diploma in public health.

It is interesting to note that this vital clause no longer exists.

A staunch and fearless supporter of professional ethics, he with the other members of the Medical Council of Tasmania was summarily dismissed from office by the then Premier of the State for their opposition to the Government's intentions.

Educated as he was in the old classical school, he loved good literature and had that intellectual outlook which unfortunately is slowly disappearing from the medical profession of today.

Of rather a retiring disposition and always averse to publicity, he was most fortunate in the possession of a charming and devoted wife and children, and it is interesting to note that her grandfather (she was a Miss Wilmore) was a medical man, his diploma bearing the date 1819.

Although he had at one time probably the most extensive practice in Tasmania, his hand was ever ready to help the poor and sick without fee or reward save the gratitude which flowed toward him in an ever-increasing stream.

In taking farewell of him, the profession of medicine may in all truth quote the words taken from the Gospel of Saint Luke, himself a beloved physician: "Well done, thou good and faithful servant."

Dr. C. Craig writes:

It seems impossible that the familiar figure of the late Dr. George Clemons will never be seen again about the Launceston General Hospital. Since the honorary staff was first appointed in 1925 he laboured long and hard in the interests of the hospital, and his great enthusiasm was an example and inspiration to all. A few days before his death he performed an action that was highly characteristic. His temperature was already high and he had difficulty in seeing, but nevertheless he rang up a colleague to upbraid him for not bringing in a certain article in a medical journal. The journal was brought in, and next day the article was duly discussed. Dr. Clemons had some other interests in life. He was fond of racing and shooting, but his great passion was the study and practice of medicine. He did not mind very much what department of medicine it was. He was just as ready to discuss cataract as he was the causes of anæmia or the results of gastro-enterostomy. Almost to the end of his days he practised midwifery and brought into the world the children of many of his colleagues.

He was a surgical honorary, however, and of course was very interested in this branch of medicine and particularly in the application of anatomy to surgery. His last reading at night was always a chapter of Beasley and Johnson's "Surgical Anatomy". One winter he spent every evening in the post-mortem room dissecting with a young colleague who wished to study for his M.S. degree. He felt well rewarded when the degree was obtained. His love of anatomy made him very fond of post-mortem work, and whilst doing a post-mortem he would frequently turn aside from the main subject to do a little dissecting illustrating some anatomical problem. He would often ring up with some urgent anatomical problem which he wanted to settle at once. "I want to dissect a hand" or "I have just amputated a limb and would like to dissect it at 5 p.m." were typical requests.

A few weeks ago he rang me up to go down to his rooms, as he had something he wished to show me. I went down late one afternoon. He opened the door himself, and as it was a hot day he was in his shirt sleeves. He went straight up to his study, where he had evidently been reading. A new book on psychology lay opened on his desk and an open medical journal was laid out on a couch near by. It turned out that he wished to present me with an old print of Launceston that he had discovered somewhere (another typical action). The conversation inevitably soon turned to medical subjects, and he made me read a chapter of the book on psychology which he had been studying. This led to a discussion of mind, and this led still further to a discussion on life after death. He told me that he could never make up his mind on the subject of life after death; but he added that if there was such a life he was quite certain that he knew what he wanted his to be. At this moment the telephone bell rang, so that I did not hear what was his idea of a future life. Those of us who knew him, however, know very well what his idea of a future life would be. The days would be devoted to the practice of medicine and the evenings to the study of current medical journals. The last half-hour of every evening would be devoted to Beasley and Johnson's "Manual of Anatomy".

A former inspector-general of mental hospitals writes:

In the death of Dr. G. E. Clemons, Launceston and the north, in fact the whole of Tasmania, have suffered the loss of a great humanitarian with all its implications, the greatest of all in his case being those of charity and goodwill, and the medical profession of Tasmania a great doctor, an example to all by his interest in and encouragement to the younger ones, and always an upholder of the old Edinburgh traditions of medical practice.

As an all-round practitioner he rivalled the best. An able surgeon, a pædiatrician of no mean skill through his residence at the Liverpool Children's Hospital, a good *accoucheur* through his training at the Rotunda, doing good ear, nose, throat and eye work, and in the old days even cataract operations; he also had in his house a good X-ray installation and a small clinical laboratory.

After this preamble, as an old friend of many years I would like to pay the greatest possible tribute to the character which stood behind. My first meeting with Clem, as he has been for the last sixty years to all his school contemporaries, was in the year 1884, when we were co-pupils at the Launceston Church Grammar School. There as a leader he showed the same kindly altruism to his school fellows, which blossomed and fructified to the full in his relationships with his environment when he came

to the more serious battle of life. This and his unfailing sense of humour inherent in him developed more and more. Before going to Edinburgh he spent some six to twelve months walking the Launceston General Hospital and then on to Edinburgh.

Returning to Launceston, added to his undoubted skill was the keenest and kindliest interest in the individuality of his patients, which extended to the doings of all the individuals in that family—a characteristic of the old family doctor. His attention to and interest in the poor and his failure to send out bills were proverbial, and many homes in Tasmania have cause to remember his charity and freely given medical services, and of those the best. During forty years on my annual holidays I have been privileged to see a good deal of his practice and have profited not only professionally, but in other ways, by his great example. One could go on enlarging, but nothing that I could possibly say would be too good for the example set by Dr. Clemons. In his work he was worthily supported by his wife, who was imbued with the same altruistic outlook as he was.

EDWARD FRANCIS O'SULLIVAN.

We regret to announce the death of Dr. Edward Francis O'Sullivan, which occurred on February 24, 1942, at Melbourne, Victoria.

Nominations and Elections.

The undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Hamilton, Donald Graham, M.B., B.S., 1936 (Univ. Sydney), "Kirriemuir", Church Street, Carlingford.

Hegarty, Vincent Henry, M.B., 1941 (Univ. Sydney), Saint Vincent's Hospital, Darlinghurst.

Swirles, Colin Moorcraft, M.B., B.S., 1941 (Univ. Sydney), Sydney Hospital, Sydney.

Joseph, Lynn Harvey, M.B., 1941 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

Medical Appointments.

Dr. Henry Erskine Downes has been appointed a member of the Enemy Raids Precautions Committee in the Australian Capital Territory, in accordance with the provisions of the *Enemy Raids Precautions Ordinance*, 1942.

Dr. Thomas Robert Gaha, of Hobart, Tasmania, has been appointed a member of the Betting Control Board, in pursuance of the provisions of the *Bookmakers Act*, 1932.

Dr. Edward Brettingham-Moore has been appointed to the Board of the Hobart Public Hospitals District as the nominee of the registered medical practitioners residing and practising in the said district, in pursuance of the provisions of the *Hospitals Act*, 1918.

Under the provisions of the *Quarantine Act*, 1908-1924, Dr. Alexander Thomas Hicks Jolly has been appointed Quarantine Officer at Broome, Western Australia, and Dr. Harold Newbon White has been appointed Quarantine Officer at Sydney, New South Wales.

Books Received.

"Textbook of Medical Treatment", by various authors, edited by D. M. Dunlop, B.A., M.D., F.R.C.P., L. S. P. Davidson, B.A., M.D., F.R.C.P. (Edinburgh), F.R.C.P. (London), and J. W. McNee, D.S.O., D.Sc., M.D., F.R.C.P., with an introduction by the late Professor A. J. Clark, B.A., M.C., D.P.H., F.R.C.P., F.R.S.; Second Edition; 1942. Edinburgh: E. and S. Livingstone. Demy 8vo, pp. 1,203. Price: 25s. net.

"Australia Limited", by A. J. Marshall; 1942. Sydney: Angus and Robertson Limited. Crown 8vo, pp. 118. Price: 2s. 6d. net.

"Doctor of Tanganyika", by Paul White, with an introduction by Archdeacon R. B. S. Hammond; Second Edition; 1941. Sydney: George M. Dash. Demy 8vo, pp. 100, with illustrations.

"The Doctors Mayo", by H. B. Clapesattle; 1941. Minneapolis: The University of Minnesota Press. Medium 8vo, pp. 836, with 64 illustrations. Price: $3.75.

"The 1941 Year Book of Pathology and Immunology", edited by H. T. Karsner and S. B. Hooker; 1941. Chicago: The Year Book Publishers, Incorporated. Crown 8vo, pp. 623, with 136 illustrations. Price: $3.00.

"Probation for Juvenile Delinquents", published under the direction of the Australian Council for Educational Research; 1941. Melbourne: Melbourne University Press. Demy 8vo, pp. 51. Price: 1s. net.

Diary for the Month.

MAR. 10.—Tasmanian Branch, B.M.A.: Branch.
MAR. 13.—Queensland Branch, B.M.A.: Council.
MAR. 18.—Western Australian Branch, B.M.A.: Branch.
MAR. 24.—New South Wales Branch, B.M.A.: Council Quarterly.
MAR. 26.—New South Wales Branch, B.M.A.: Annual Meeting.
MAR. 26.—South Australian Branch, B.M.A.: Branch.
MAR. 27.—Queensland Branch, B.M.A.: Council.
MAR. 27.—Tasmanian Branch, B.M.A.: Council.
MAR. 31.—New South Wales Branch, B.M.A.: Council.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

Editorial Notices.

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